



Surgical management of empyema thoracis – a 7 year experience in christian medical college hospital,vellore.

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Introduction

Empyema thoracis,a localised infection of the pleural cavity, is a disease whose description dates back to the historical times of Hippocrates and is still proving a menace to the modern medical community. The disease is a common health problem faced by thoracic surgeons, carrying significant morbidity and mortality.(1) It is a complex disease with varying modalities of treatment . A lack of a single ideal treatment modality or policy reflects the complexity of the diagnosis and staging of this heterogeneous disease.

Materials and Methods

The study was conducted in Department of Cardiothoracic Surgery, Christian Medical College and Hospital,Vellore.It was a retrospectiveobservational study.The study based on the hospital records and data bank of the patients maintained in the institution.The duration of study was from a period of January 2009 to Dec 2015 and all the patients undergoing surgery for empyema thoracis in CMCH Hospital above the age of 15 years were included in the study.

After reviewing the data of the patients, age and sex of the patients, the presenting complaints and the duration of the symptoms were categorized. Details of investigations including pre operative culture and analysis of pleural fluid and treatment given prior to surgery were studied. Associated co morbid illness were documented. The surgery done and the postoperative cultures and biopsy reports were also analyzed.The complications and post operative stay was noted for each patient.The result of the surgery in the follow up of the patient was evaluated and charted.

Results

A total of 321 cases of empyema thoracis were surgically managed in the 5 year period from 2009 to 2015 at Christian Medical College Hospital, Vellore.The sex distribution of the patients were 267 male(85.7%) and 54 female (14.3%) patients. Most of the patients who were operated were in the age group of thirty to forty years.. Right side was most commonly affected with 189 patients(59.4%) having pathology on right side . Among the total 321 patients, 180 patients(59%) had previous history of ICD insertion. In this study, only 45 patients were smokers. (9.5%).There were 185 tuberculosis patients (45.6%) in our study. 75 patients (20.3%) had diabetes mellitus as a risk factor for development of empyema thoracis. In this study, eight patients had infected hydatid cyst which ruptured into the pleural cavity to produce empyema.Trauma was the cause of empyema in 26 cases out of which 4 of them were iatrogenic.Two patients had haematological disorder and 10 patients had chronic kidney disease as co morbid conditions.

The most common presenting complaints were cough (54.7%), fever(44%), chest pain(29%) and dyspnoea(26%).Out of the 321 patients studied, 78 patients had complaints for less than 1 month duration, 162 patients had complaints of duration ranging from 2 – 6 months., 41 patients had complaints for 7–12 months.Out of the 321 patients, 88 patients (27 %) showed the presence of organisms in the pre operative pleural fluid culture. Mixed growth of organisms was the most common in pre operative culture, followed by Pseudomonas and Non fermenting Gram negative bacillus. Pleural fluid analysis was done for only103 patients pre operatively. Among the 103 patients who had undergone preoperative pleural fluid analysis,91patients had stage III empyema.,9 patients had stage II empyema, and only 3 patient had stage I empyema.

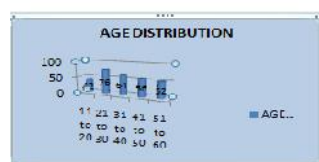
Among the 321 patients who underwent surgical procedures, 182 patients had undergone window procedure among which 82 patients had active tuberculosis, 103 patients had undergone decortication procedure among which 60 patients had active tuberculosis, 8 patients had undergone thoracoplasty with BPF closure alone, 40 patients presented with bronchopleural fistula out of which 9 cases were closed with omentoplasty and rest of the cases were managed with direct closure. and 70 patients had undergone combined surgery. Twenty eight patients in this study underwent surgery for empyema which was a complication of an earlier surgery. The post operative cultures showed the presence of bacteria in 142 cases. Organisms commonly identified in the postoperative cultures in the decreasing order of frequency were pseudomonas, staphylococcus aureus, mycobacterium tuberculosis, nonfermenting gram negative bacilli, streptococcus, klebsiella, E.Coli. Other organisms identified were enterobacter, enterococcus, proteus, acinetobacter, aeromonas, citrobacter, H.influenza and morganella. Majority of the cases showed chronic pleuritis in the postoperative biopsy reports followed by caseating granulomas and necrotic lung. Three cases of malignancy were incidentally detected. Twenty nine patients had complications in the postoperative period. Six patients had prolonged air leak of which two were managed conservatively and one required redo surgery.

Tables and charts

1. SEX DISTRIBUTION



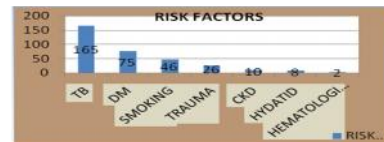
2. AGE DISTRIBUTION



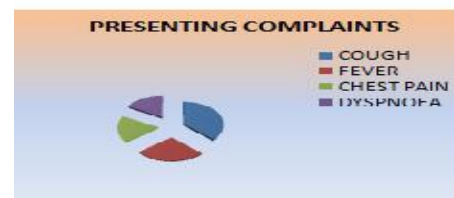
3. SIDE AFFECTED FACTORS



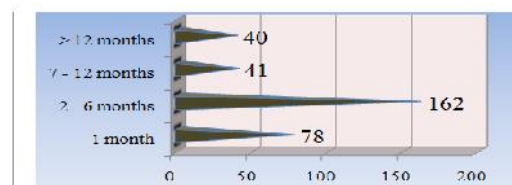
4. ETIOLOGY & RISK FACTORS



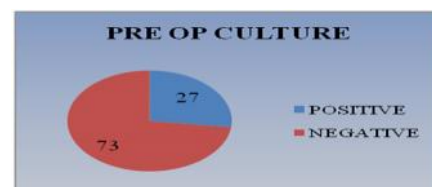
5. PRESENTING COMPLAINTS



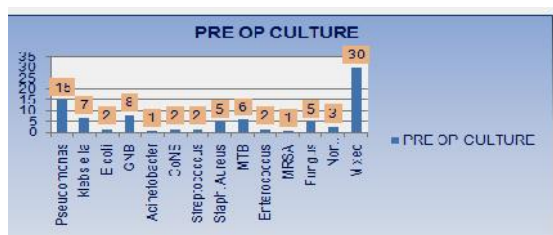
6. DURATION OF SYMPTOMS



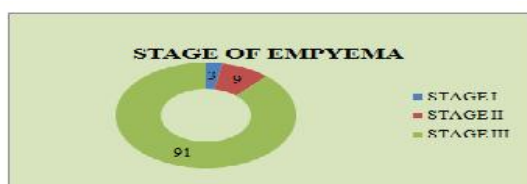
7. PRE OP CULTURES



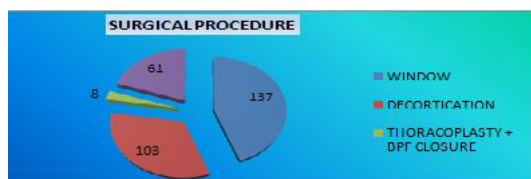
8. PRE OP CULTURE-ORGANISMS



9. PLEURAL FLUID ANALYSIS & STAGE OF EMPYEMA



10. TYPES OF SURGICAL PROCEDURES



11. POST OP CULTURES- ORGANISMS



Discussion

We analyzed 321 patients retrospectively who underwent surgical treatment for empyema thoracis' in our institute for a period of five years between January 2009 to December 2015. Those patients under the age of 15 years are not included in this study.

Out of the 321 patients analyzed, male sex clearly dominated the picture, accounting for about 85.7% of the patients. This male sex predominance is observed in most of the other studies like Acharya et al and Dass et al(2). The availability of over the counter drugs for cough with expectoration and the delay in seeking medical attention are the factors that are responsible for increased incidence of the disease in males.

Most of the patients in our study were in their third and fourth decades of life. A similar picture of age distribution is observed in the study by Preetam rajgopal et al.(2) Among the 321 patients studied, 189 patients had disease in the right side. However, Acharya et al (2) in his study observed that left pleura is more commonly involved.

In our study, about 54% had previous history of ICD insertion. Our institution being a tertiary care centre, receives patients who fail to respond to medical management done elsewhere. Patients presenting with symptoms of pleural infection are initially dealt by thoracic physicians and only those patients who fail to respond to medical modalities of management like antibiotics, bronchodilators, closed tube thoracostomy, intrapleural instillation of fibrinolytics like streptokinase or urokinase and thoracoscopic adhesiolysis are referred for surgical management.

Only 9.5% of the patients in this study revealed the history of smoking in the past. This is quite a different demographic picture found in this study which is contradicting with other studies like Tanimowo MO et al, Daniel JB et al(3)who also observed that about 50% & 29% of the patients with empyema were smokers respectively.

Our study clearly depicts that most of our patients are tuberculosis (56.6%) & diabetics(20.1%),smokers(9.5%) which is contradictory to the UK multicentric study done by Daniel JB et al,(4) where their patients were mainly malnourished(46.3%), sepsis (36.4%),smokers(29%),diabetes(8.1%), post traumatic(6.7%). This is because that progressive and end stage tuberculosis are quite common in our population where as it is rare in western population.

Most of the patients in our study presented with were cough(55%), fever(44%), chest pain(26%) and dyspnoea(26%) in decreasing order of frequency which is almost resembled in the study done by Preetam Rajgopal Acharya and Kusum V. Shah.(4)

Regarding the bacteriological profile in our study, the most common organism identified was pseudomonas in both pre operative and postoperative culture . But in contrary , other studies like Narayanappa et al, Somenath Kundu et al (5) , showed that the most common organism was staphylococcus aureus followed by pseudomonas and mixed organisms. Since most of our patients were initially treated by pulmonologists diagnostic thoracocentesis, thoracoscopy and pleural biopsy, intrapleural instillation with different modalities of medical management like closed tube thoracostomy, of fibrinolytics, the chance of acquiring nosocomial organism like pseudomonas is more in our patients.

As most of our patients were treated by empirical antibiotic therapy elsewhere before admission which was reflected in the positivity (27%) of culture and sensitivity reports obtained .In a study conducted by Jain Sonali et al,(6) pus culture was positive in about 31.3% of their patients. In our study , decortication and window procedure comprises of about 30.8% and 40% of total patients respectively with the rest being thoracoplasty and combined surgeries. Open drainage is the treatment of choice for debilitated patients with chronic empyemas when a large pleural space exists and prolonged drainage is anticipated.

In our study, decortication and window procedure comprises of about 30.8% and 40% of total patients respectively with the rest being thoracoplasty and combined surgeries. Open drainage is the treatment of choice for debilitated patients with chronic empyemas when a large pleural space exists and prolonged drainage is anticipated. Postoperative complications in our study were prolonged air leak, prolonged ICD drainage, persistant space due to inadequately expanded lung fields, fever, bronchopleural fistula. In comparison to the study done by Christian Casali et al (7) complications encountered in our study were little different. Their postoperative complications were persistent air leak (>5 days), postoperative bleeding, pneumonias and cardiac arrhythmias.

Mean postoperative stay of patients who underwent decortications in our study was 14.5± days which is lower than that observed in study done by Hung-Che Huang et al(8)

In our institute, those patients who underwent window procedure were treated as inpatients till they required twice daily dressings. Once soakage of dressings became less, patients were discharged and adviced to come for daily dressing as outpatient. This is done mainly to decongest the ward and reduce the financial burden of the patients.

Conclusion

Decision-making relies on the triad of the aetiology of empyema, general condition of the patient and actual stage of disease, considering the triphasic nature of it.

Decision-making protocols cannot function without clear and unmistakable categories. Basic elements of intervention-drainage, different evacuation techniques, decortication, thoracoplasty, open window thoracostomy - are well-established. Most patients in stage III empyema were managed effectively with window thoracostomy. Mortality is very low when compared to other studies which illustrates the selection of patients, intra operative and postoperative management in our institute.

Most patients in stage III empyema were managed effectively with window thoracostomy. Mortality is very low when compared to other studies which illustrates the selection of patients, intra operative and postoperative management in our institute. In this study, males predominate and most of the affected patients were in their third and fourth decades. Majority of the patients presented with cough as the presenting complaint. In this study, majority of the patients underwent either decortication or window procedure and only a few underwent thoracoplasty.

In contrast to other studies, pseudomonas predominate in the post operative culture. Only two patients required refashioning of window because of inadequately expanded lung. As observed in any other part of our country, post operative follow up is a major concern. Since most of the patients come from far off places and are of poor socio-economic status, many default.

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