International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor (2018): 7.426

Decortication is Better Treatment Option in Chronic Pleural Empyema

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Abstract: ***Objective: The aim of present study is to evaluate the role of decortications in management of chronic pleural empyema. Methods: From July 2014 to Jan 2019, 22 patients of chronic empyema mostly due to tuberculosis who were subjected to decortication at our hospital were evaluated prospectively. Patients were subjected to detailed clinical, radiological and other diagnostic evaluation for etiology, duration of treatment and response. Decision for decortication was taken on the basis of long duration of treatment, poor response to antibiotics and antitubercular medication, atypical chest pain, intercostal tube drainage and thickness of parietal pleura. All the patients were followed up for six months except recent cases. Results: Out of 22 patients, who were subjected to decortication, 14 patients were male and 8 was female between age group (range 15-70 years).The mean duration of symptoms was 6.4 months (range 1-24 months). The mean duration of preoperative antitubercular treatment (ATT) was 4 months (range 2 weeks to 12 months). Preoperative spirometry showed moderate restriction. Postoperatively all patients showed good recovery. Spirometry after decortication showed satisfactory improvement. One case were having severe fibrosis latter on on biopsy diagnosed as carcinoma. Conclusion: Decortication is the safe and effective treatment for chronic organized empyema, enabling complete expansion of the lung.***

Keywords: empyema, decortications

1. Introduction

Empyema thoracis management is always challenging. Empyema due to tuberculosis (TB) is increasingly prevalent in TB-endemic countries.[1,2]Empyema often causes substantial morbidity and mortality. In 1962, the American Thoracic Society[3,4]described the 3 phases of empyema as exudative (stage I), fibrinopurulent (stage II), and organizing (stage III). In the initial exudative stage, closed chest drainage and appropriate antibiotic administration can comprise effective treatment. Tubethoracostomy, catheter drainage, thoracoscopy drainage, intrapleural thrombolytic, decortication and open drainage have all been used with success rates ranging from 10 to 90% [5,6]. Management strategies and its success depend on stage of the empyema at presentation. The most common cause of empyema thoracis is pulmonary infection. Early treatment with antimicrobial agent and ICD drainage of empyema cavities preventing thickening of pleura and lung collapse. Early and proper management prevent progression of disease through exudative phase and firbrino-purulent phase to organizing chronic phase. Organised chronic phase , visceral pleural fibrosis limits re-expansion of the lung. Due to presence of thick pus, encapsulation by chronic inflammatory tissue, poor drug penetration leads to sub-therapeutic drug levels of medication may cause failure of medical treatment and development of acquired drug resistance. Empyema due to low virulent infectious agent progression are indolent, so, clinician often sees patient after it has reached the firbrino-purulentor organized stage. At this stage role of antimicrobial, tube thoracostomy and intrapleural thrombolytic is limited. Decortication is the safe and effective treatment in the organized empyema, enabling near to complete expansion of lung. [7,8]

2. Material and Methods

This is prospective study include all patients of chronic empyema who were subjected to decortication at our tertiary care center between June 2014 to jan 2019 were evaluated. The patients included were 14 male and 8 female, who had earlier received treatment at peripheral hospitals and subsequently transferred to our center because of poor response. A detailed history and meticulous clinical examination was carried out. Investigations included tuberculin test, pleural fluid analysis, chest x-ray, ultrasound thorax, CT scan of chest, pulmonary function test and fibre-optic bronchoscopy. Decision for decortication was taken on the basis of long duration of treatment, poor response to antibiotic and intercostals drainage, persistence of empyema cavity and thick pleural peel. Preoperatively most of patients were put on ATT for minimum duration of 4 weeks. Postoperatively a full course of ATT was given if histopathology of resected pleura confirmed tubercular etiology and it was stopped in nontubercular cases. All patients were reviewed clinically, radiologically. In postoperative period all patient were adviced for spirometry. All patient were followed up after two months of decortication and then six monthly.

3. Results

During the period June 2014 to Jan 2019 out of 150 patients of empyema thoracic, irrespective of aetiology and one case of empyema necessitans , 22 patients were subjected to decortication. It included 14 male and 8 female between age group 17-70 years. The mean duration of symptoms at the time of presentation to our hospital was 6.4 months (ranging

from one to 24 months). Fever, cough, chest pain, dyspnoea and weight loss were common symptoms in these patients.

The clinical presentation was suggestive of Parapneumonic effusion in6 patients and tubercular in rest 16 patients. Pleural aspirate was exudative with predominance of lymphocytes in 22 patients. Tuberculin test was positive in 12 patients. Failure of response was seen in 14 patients who had undergone intercostal tube. Twenty out of 22 patients had received ATT for a mean duration of 5 months (range 2 weeks to 12 months) prior to decortication. Concomitant lung resection was done in one patients (lobectomy). Rib resection was needed in 12 cases during thoracotomy. Pre-operative spirometry showed moderate restrictive defect. Post operatively clinically patient get relief in pain , breathlessness. On gross pathological evaluation, the average thickness of pleura was found to be 1 cm (range 0.5 – 4 cm). In 1 patient aetiology could not be ascertained as severe fibrosis with fragile lung tissue found, having suspicion of malignancy, as latter on proved by histopathology. Postoperatively all patients showed satisfactory improvement. All patients (except patient with suspicion of carcinoma was send with ICD in situ) were successfully cured of their disease and there was no recurrence during six months follow-up.

4. Discussion

The therapy of empyema thoracis requires appropriate antibiotics, drainage and spirometry. Tuberculosis may be the most frequent cause of empyema in population with high tuberculosis prevalence.Success rate of various therapeutic procedures in management of empyema depends at least partly on the stage of empyema at presentation[4]. In the initial exudative stage, effusion will resolve with the resolution of pneumonia. In this stage antimicrobial and chest tube drainage or pleral tapping , usually results in cure. In the second fibrino-purulent stage, antibiotics with chest tube drainage may resolve the empyema. Ultrasound showing evidence of fibrinous organization (i.e fronds, septations , loculations, or thickening of visceral pleural surface) points to fibrinopurulent stage[9]. The optimal management of these empyema includes breakdown of adhesions to effective drainage of infected pleural fluid. [10] The use of fibrinolytics intrapleurally appears to enhance intercostal tube drainage, reducing the requirement for subsequent surgical mechanical debridement. Early surgical intervention may be indicated for medical treatment failure and, as a suitable alternative to other medical interventions. But if empyema is not managed properly in early stage, it will progress to fibrino-purulent and organized chronic stage. Various factors responsible for this progression in our study were attributed to lack of chest physiotherapy, delay in intercostal tube drainage and inadequate and improper antibiotics and Antitubercular medication. In a randomized control trial, Wait at al evaluated the effectiveness of tube thoracostomy and intrapleural streptokinase versus VATS in patients with loculated parapneumonic empyema. They found a benefit to early VATS.[11] Because of high prevalence of tuberculosis in our country, most of the patients with chronic empyema were attributed to tuberculosis[10]. Histopathology of rescected pleura in 6 out of 22 patients were confirmed non-tubercular. These patients were being treated as tubercular empyema because of poor response to antibiotics. In tubercular empyema, initial aspirate were exudative suggesting that in most of these patients empyema developed predominantly because of introduction of infection during aspiration, which is preventable.

Late empyema, which have reached the organized phase are characterized by the presence of thick pleural peel causing varying degree of pulmonary parenchyma entrapment. Granuloma, lymph mononuclear infiltration, necrosis and fibrosis suggestive of tubercular etiology was seen in 18 out of 22 patients. There are many surgical studies that show decortications to be safe and effective for treating empyema[10-14]. In general, both VATS and open decortications have been shown to be safe and effective in the organized empyema enabling complete lung expansion[11-15] . It allows a more rapid recovery with a decreased number of chest tube days and decreased length of hospital stay. The success rate for decortication is 90- 95%. In our series success rate was 100%. Broncho-pleural fistula is a common complication in management of these patients however we did encounter one such patien who was suspicious of carcinoma latter on confirmed by biopsy. One of our patient undergone lobectomy along with decortications. Excellent success rate achieved was possibly because most of our patients were young who were not having any other co morbid diseases, expertise of surgeon and better post operative care. We were tried VATS in one case but getting converted.

This study concludes that decortication should be considered early in a patient of chronic organized empyema, enabling complete expansion of the lung and preventing morbidity.

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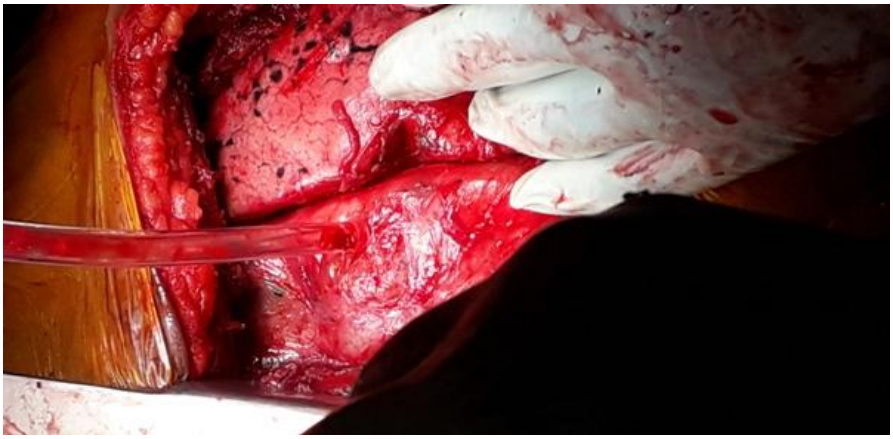
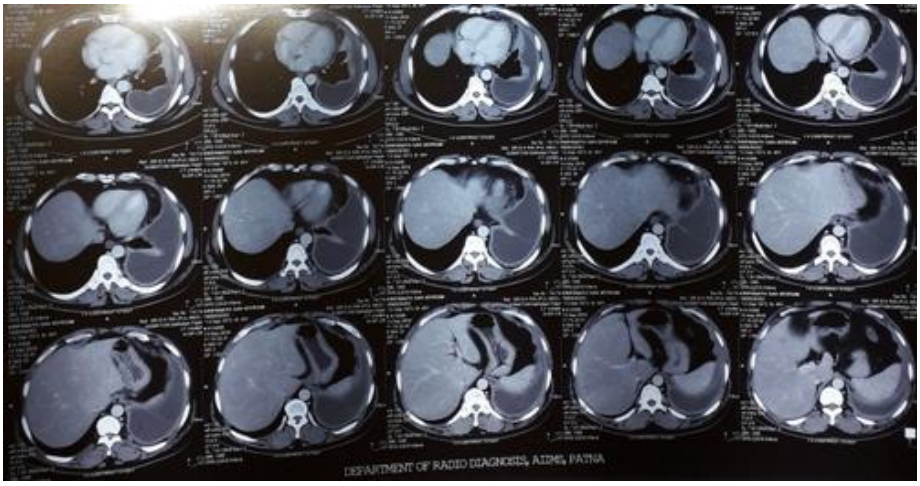
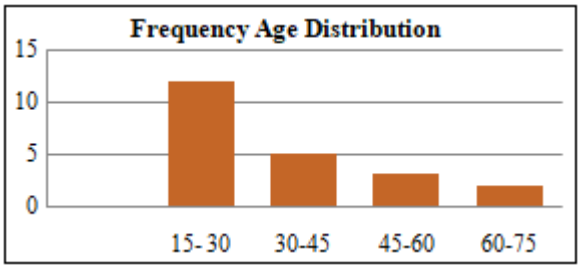


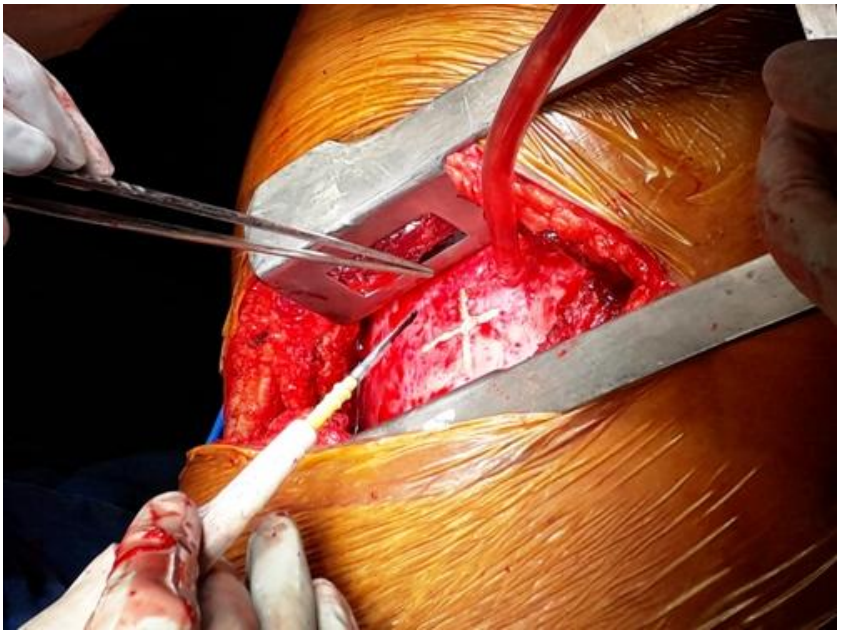
On Table Expansion of Lung after removal of Thickened Parietal Pleura and Fibrosis of Visceral Pleura



CECT thorax suggesting organised empema



Maximum Decortications Seen in Young Age Group



Thickened Parietal Pleural Excision