

ORIGINAL ARTICLE

Tuberculous Empyema Thoracic -Surgical Perspective

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ABSTRACT:

Objective: To find out the difference in outcome of patients undergoing surgery for tuberculous empyema in early V/S late stages of disease.

Subjects and Methods: This is a retrospective study of 163 patients of 20-50 years of age who underwent thoracotomy and decortication for tuberculous empyema thoracic from July 2009 to June 2013. Patients were divided into two groups on the basis of their duration of use of Anti-Tuberculosis Therapy (ATT). Group A (n=80) took ATT for 2 months and Group B (n=83) took ATT for 4 months and above. Age less than 20yrs and above 50yrs, poor functional and nutritional status, underlying parenchymal disease, A.T.T. Defaulters and MDR T.B were excluded.

Results: There was no mortality in Group A, while 1 mortality occurred in Group B. Mean day of discharge was 5th post-operative day in Group A and 6th in Group B. 7 patients from Group A and 13 patients from Group B had wound complications whereas 5 patients from Group A and 12 from Group B required up to 10 day of hospitalization due to prolonged air leaks. 1 patient from Group B required revision of procedure and ended up with pleurocutaneous window.

Conclusion: Operating patients early with T.B Empyema Thoracic carries better results if compared to those operated at a later stage. Patient selection is an important factor. Key to success is adequate intake of A.T.T. dose by the patients

Keywords: Tuberculosis, Empyema thoracic, Decortication, Thoracotomy.

INTRODUCTION:

Tuberculosis (TB) is a leading pulmonary disease; approximately 8 million new cases of tuberculosis are reported worldwide annually, resulting in 3 million deaths.

Tuberculosis is an infectious disease caused by Mycobacterium Tuberculosis; other species of mycobacteria can also produce similar changes of granulomatous response associated with intense tissue inflammation. Pleural tuberculosis is the most common form of extra-pulmonary tuberculosis, which originates from primary infection in 90% cases, while in 10% cases it is due to reactivation of cavitated or fibrocaceous lesion. TB Empyema thoracic is relatively rare about 3-5% of all tuberculosis cases in the developing world and is 10th most common cause of pleural effusion in US, while situation is quite different in developing world where tuberculosis is endemic and it is the most common cause of empyema thoracic. HIV co-infection and multi drug resistant TB (MDR-TB) are changing the epidemiology of TB empyema and the incidence is as high as 90%. Empyema thoracic is defined as pyogenic infection in the pleural cavity. This condition is usually a complication of para-pneumonic effusions, surgery, traumatic haemothorax and other conditions¹. In developing countries the majority of patients with empyema thoracis

are due to tuberculosis². The objectives of empyema thoracis treatment is to ensure that the pus is completely drained so that the entrapped lung expands in pleural cavity to fill the pleural space. This helps to eliminate the complications and chronicity of the disease. Thoracocentesis, tube thoracostomy, intrapleural thrombolytics (urokinase), thoracoscopic drainage, open drainage and decortication have all been used with success rates ranging from 10 to 90%³. The aim of this study was to find out the difference in outcomes of patients undergoing surgery for tuberculous empyema thoracic in early V/S late stages of disease.

SUBJECTS AND METHODS:

This retrospective observational study was carried out in the department of cardiothoracic surgery, Liaquat National Hospital and Medical College, Karachi. Records of the patients were reviewed and 163 patients both males and females, 20-50 years of age taking A.T.T in calculated dosage with monitoring. They underwent thoracotomy and decortication for Tuberculous Empyema Thoracis from July 2009 to June 2013. They were identified and included in the study. Patients were divided into two groups on the basis of their duration of use of Anti-Tuberculosis Therapy (ATT). In Group A, 80 patients were included who took ATT for 2 months and in Group B, 83 patients were included who took ATT for 4 months and above. Diagnosis of tuberculosis was made on the basis of pleural fluid analysis and CT scans showing findings consistent with tuberculosis. Patients less than 20 years and above 50yrs., patients with poor functional status and nutritional debilitation, patients with significant underlying parenchymal disease /bilateral as revealed by CT Scan chest, A.T.T. defaulters and absconders and patients with MDR T.B were excluded from the study.

RESULTS:

There were 98 males and 65 females. Age wise distribution is shown in figure 1. Patients with left sided pleural effusion were 85 and patients with right sided pleural effusion were 78. All the patients had presence of air fluid

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levels on chest x-rays and thickened pleura along with split pleural sign on CT scan. Laboratory analysis of all the pleural effusions showed monocytic exudate suggestive of tuberculosis. All patients were treated with posterolateral thoracotomy and decortication. Average operating time of Group A was 2 hours and 30 minutes and of Group B was 2 hours and 50 minutes. In Group A there was no mortality while in Group B there was 1 mortality due to ventilator associated pneumonia. In Group A all cases had complete resolution of the empyema along with improvement both clinically and radiologically with only 7 cases having postoperative wound complications and 5 patients required up to 10 days of hospitalization due to air leaks as shown in figure 2. Group B had higher post-operative complications. 12 patients required upto 10 days of hospitalization due to air leaks, 13 had wound complications and 1 patient required revision of procedure and ended with pluro cutaneous window.

Figure 1

Age-wise distribution of patients with TB empyema

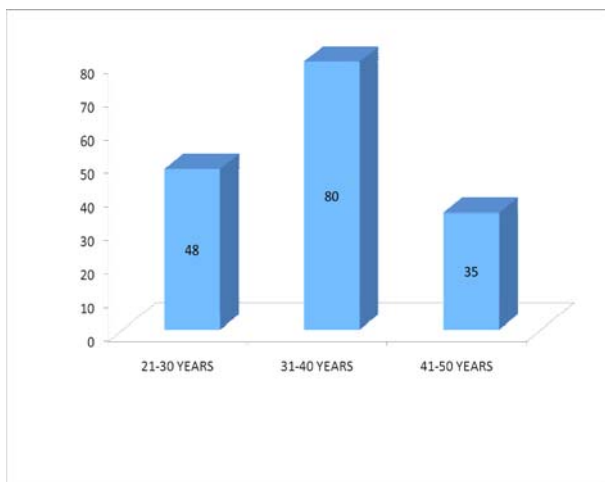
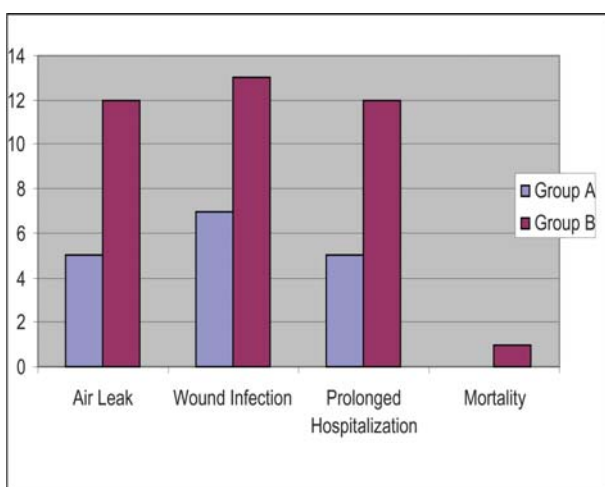


Figure 2

Outcomes of Both Groups



DISCUSSION:

Currently Tuberculosis is more considered as a medical rather than a surgical disease. Tuberculosis (TB) is very much linked to the history of thoracic surgery and it can be traced from history that Hippocrates himself performed the very first thoracic surgical procedure of open drainage of pleura for empyema thoracic resulting from TB³. Empyema thoracic is an important cause of morbidity and mortality in developing countries. It can be reflected from our study that males are more affected than females and this is consistent with other studies from the neighboring countries⁴. Majority of patients with tuberculous empyema thoracic presented at young ages i.e. < 40 years of age. In a study done by Acharya et al the median age of patients with tuberculous empyema was 21-40 years⁵. All the cases had formation of a fibrinous inelastic membrane on the surface of both the pleura. Pulmonary infections may lead to empyema formation of which tuberculosis is the most common cause. As the case with any other parapneumonic effusion, tuberculous effusion with pleural involvement - exudative stage can progress into fibrinopurulent empyema thoracic and organized fibro thorax⁶. This is referred as pleural cortex. This is the third stage of the empyema formation also referred as the organization stage. It causes the lung to encase, with less expansile ability. The only treatment of this stage is thoracotomy and decortication⁷. Thoracotomy and decortication is the method of choice when the lung is entrapped in the thick inflammatory coat and the patient is fit for surgery⁸. In the study of Choi, empyemectomy and decortication resulted in better post operative outcomes in patients with tuberculous empyema in-terms of improved pulmonary function⁹. Gokce has documented that open decortication significantly raises the FEV1 and FVC ratio by re-expanding the entrapped lung from the thick fibrous peel along with enlargement of the intercostal spaces further improving any chest wall deformities¹⁰. Various strategies are being developed for the treatment of tuberculous empyema thoracic. These are video assisted thoracoscopic surgery, medical thoracoscopy under local anesthesia and the use of Intrapleural Streptokinase in the management of empyema thoracic¹¹ however all these procedures do have their limitations as these procedures can be used only in cases of stage 1 or stage 2 empyema where there is no organization of the empyema into a fibrous peel. In a study done by Banga et al regarding use of Intra pleural streptokinase in chronic empyema thoracic they have suggested a trial of high dose Intra pleural streptokinase in chronic empyema patients. However this is still subject to research as being a developing country and lack of affordability of patients this methodology cannot be opted¹². An institutional report by Casali has showed that in cases where there is complete obliteration of pleural space and VATS cannot

be performed under such circumstances traditional thoracotomy and decortication is an effective approach with long term acceptable functional results¹³. In a study done by Shahin et al there was a conversion rate of 19% from VATS to open thoracotomy in patients with stage -3 empyema (Organization stage). Since all our patients presented with organization stage of empyema, VATS could not be considered the first option for surgery as suggested by this study¹⁴. Surgery should be offered without delay if the patients have persistence of infective symptoms and are not improving on medical therapy and inter costal drainage¹⁵ as our study showed that operating patients early carried better results as compared to those operated in later stages. Treatment of tuberculous empyema involves evacuation of the pus and re-expansion of the affected lung because residual pleural space has the potential of re-infection¹⁶. The overall complication rate in our study was 15%. The most common complications were wound infections being 5.8% which is consistent with the wound infection rate shown in the study done by Marks and other researchers^{17, 18, 19}. Even though surgical indications for tuberculosis and the timing of surgery are still controversial^{20, 21, 22} as we have shown in our previous study as well²³. Several authors do recommend that surgical intervention can be performed before 3 months if the medical treatment has been failed^{24, 25} and this is our recommendation as well from the current study.

CONCLUSION:

Even though tuberculosis has well established medical treatment, it has surgical indications also especially in empyema thoracic being mostly due to complications arising from the condition. The timing of surgery is very important as early surgical intervention with T.B Empyema thoracic carries better results if compared to those operated at a later stage. Patient selection are an important factor. Surgery remains the standard Treatment.

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