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Case Report

A case report on intrapleural administration of antibiotic in tuberculous empyema

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ABSTRACT

A 34-year-old male came with complaints of cough with copious yellowish expectoration, hemoptysis, difficulty in breathing and constitutional symptoms like fever, loss of weight and anorexia. Contrast enhanced computed tomography was done which showed left sided empyema likely secondary to rupture of left upper lobe lung abscess. The case was proceeded with fiber-optic bronchoscopy and bronchoalveolar lavage which showed narrowed bronchial openings on both sides. BAL analysis showed total cell count of 1500 cells/mm^3 with 70% neutrophils, 5% lymphocytes and 25% of epithelial cells and macrophages. Culture showed *Klebsiella* species and antibiotics were escalated according to sensitivity pattern. Intercostal drain with under water seal was inserted on left side and thick pus was drained and sent for analysis. Anti-tubercular treatment was started. Due to persistent drainage of pus, intra pleural administration of Streptomycin was done for 30 days. Patient was monitored with serial chest X-rays and relevant blood investigations. Good clinicoradiological resolution was noted.

Keywords: Tubercular empyema, Fiber optic bronchoscopy, Streptomycin, Intercostal drain, Intrapleural administration

INTRODUCTION

Tuberculous empyema is a rare entity characterized by purulent pleural fluid that is loaded with tuberculous organisms on AFB stains.[1] Patients usually has a subacute or chronic illness characterized by fatigue, low grade fever, and weight loss. On rare occasions, it may produce empyema necessitatis where the empyema ruptures through chest wall.[1]

Chest computed tomography (CT) scan demonstrates a thick, calcific pleural rind and rib thickening surrounding loculated pleural fluid. Diagnosis is established by diagnostic thoracocentesis which yields thick pus on which AFB smear is markedly positive.[2]

CASE REPORT

A 34-year-old male, farmer by occupation who is an occasional smoker and alcoholic from a village in the outskirts of Bangalore presented to casualty with complaints of cough since 1 month which increased on lying down on the right side with sputum production which was copious, foul smelling, yellowish in colour to begin with later on changed to blood tinged since last 1 week. Patient also give history of hemoptysis since 1 week, 2-3 streaky episodes/day, mixed with sputum, not associated with bleeding from any other sites. He also had difficulty in breathing since 1 month, MMRC grade II, increased on lying down to right side and fever since 1 month associated with evening rise of temperature, loss of appetite and loss of weight. There was no other significant past history.

On examination, the patient was conscious, oriented, tachypneic using accessory muscles of respiration. Saturation was 84% at room air, grade II clubbing present in both upper limb fingers. Chest movements and breath sounds reduced on left infra axillary and infra scapular areas and bilateral expiratory polyphonic rhonchi was heard in all the areas of the chest.

Initial chest radiograph (Figure 1) showed a left lower zone lung abscess with parapneumonic effusion.

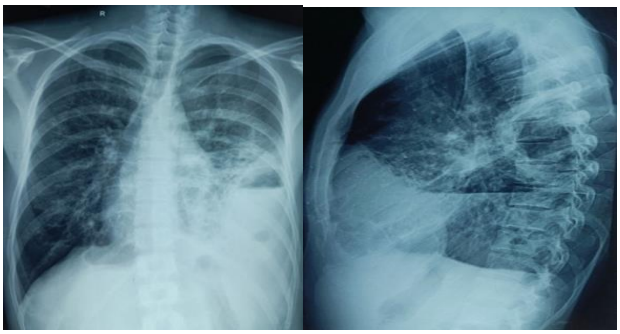

Figure 1: Chest radiographs PA and lateral views on admission.

Routine blood investigations were done which showed anemia with leukocytosis of 24, 250 cells/mm^3 with 80% neutrophils. Sputum culture had yielded normal commensals. CT thorax plain and contrast (Figure 2) was done which showed thin walled peripherally enhancing cavitaory lesion in left lower lobe, with communication to collection in left pleural cavity suggestive of left sided empyema likely secondary to rupture of left upper lobe lung abscess.

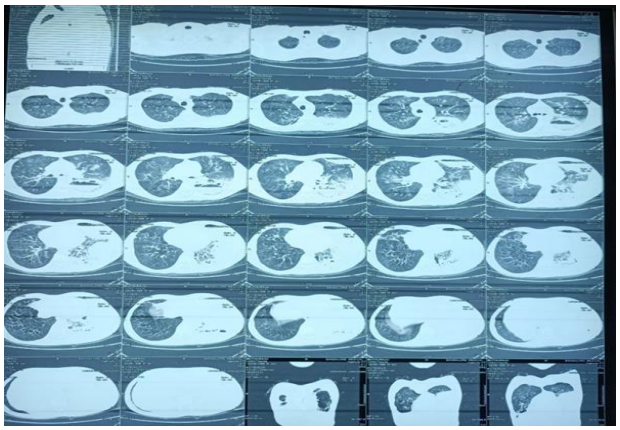

Figure 2: CT Thorax plain and contrast.

The case was proceeded with fiber-optic bronchoscopy and bronchoalveolar lavage which showed narrowed bronchial openings on both sides. BAL analysis showed total cell count of 1500 cells/mm^3 with 70% neutrophils, 5% lymphocytes and 25% of epithelial cells and macrophages. Culture showed *Klebsiella* species and antibiotics were escalated according to sensitivity pattern. Intercostal drain with under water seal (Figure 3) was inserted on left side and thick pus was drained and sent for analysis (Figure 4).

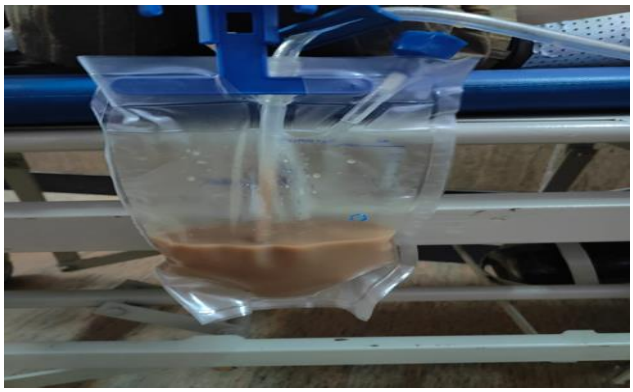

Figure 3: ICD bag showing thick pus.

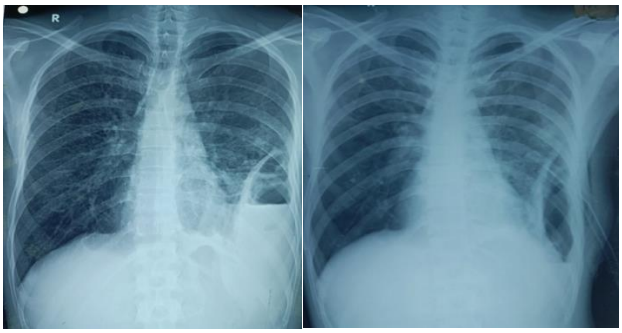

Figure 4: Chest radiograph before and after ICD insertion.

Pleural fluid analysis showed neutrophilic predominant exudative effusion with high ADA levels and low glucose suggestive of tubercular empyema. Patient was started on anti-tubercular treatment according to weight band under National Tuberculosis Elimination Programme.

In view of persistent drainage of thick pus from the pleural cavity (Figure 5), patient was started on Streptomycin 750 mg/day in 2 ml NS intrapleurally (via ICD tube) on ICD day 12.

Figure 5: Chest radiograph on day 11 prior to initiation of streptomycin.

Streptomycin was continued for 30 days with monitoring with serial chest radiographs (Figures 6 and 7).

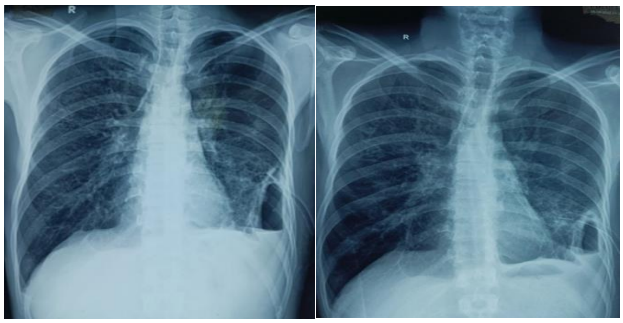

Figure 6: Serial chest radiographs on streptomycin day 8 (ICD day 19) and streptomycin day 17 (ICD day 27).

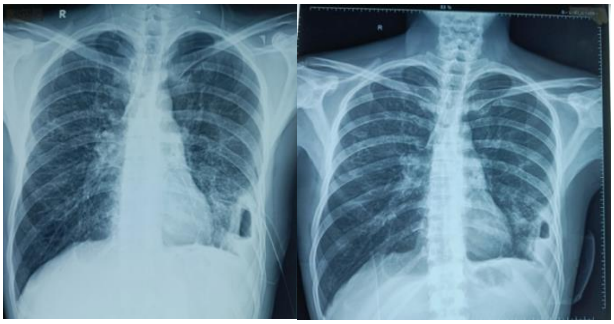

Figure 7: Serial chest radiographs on streptomycin day 27 (ICD day 36) and post ICD removal, after 30 days of streptomycin.

Patient's ICD had a total drain of around 3300ml of thick pus in 39 days and the persistent air leak due to bronchopleural fistula also healed after 30 days of intrapleural injection streptomycin together with ATT. Routine investigations such as CBC, RFT, LFT, serum electrolytes were done on a regular basis to monitor the adverse effects of the drugs. The ICD drain became less than 10 ml, air leak also became absent and hence ICD was removed on day 39. Patient had improved both symptomatically and clinically and hence was discharged \with the advice to continue ATT under NTEP and follow up in the OPD after 2 weeks.

Patient was reviewed after 2 weeks and chest radiograph was done which showed good radiological resolution (Figure 8).

Next review was after 6 months of completing ATT and chest radiograph (Figure 9) and high-resolution CT Chest was done (Figure 10).

HRCT thorax showed centrilobular nodules in right upper lobe suggestive of infective etiology and fibrotic opacities with bronchiectatic and bronchiolectatic changes in bilateral lung parenchyma, sequelae to old infection.

Figure 8: Chest radiograph at 2 weeks review.

Figure 9: Chest radiograph at the end of ATT.

Figure 10: HRCT thorax at the end of 6 months of ATT.

DISCUSSION

Tubercular empyema is a chronic and active infection by tubercular bacilli in the pleural space. It is an exaggerated pleural inflammatory response to paucibacillary infection. It is often diagnosed upon development of empyema necessities or bronchopleural fistula.[3] The management of tubercular empyema includes initiation of anti-tubercular

therapy and surgical management depending on the condition of the underlying lung. When the underlying lung is damaged, surgical interventions like lobectomy or pneumonectomy is performed.[4]

In a case report published by Long et al in Alberta, intra pleural isoniazid, levofloxacin and amikacin was used along with oral agents for tubercular empyema not complicated by bronchopleural fistula.[5] Use of intra pleural agents in combination with oral anti - tubercular therapy has been shown to cause good clinicoradiological improvement with no development of drug resistance.[6,7] A similar study conducted by Nie et al showed intrapleural injection of anhydrous ethanol could achieve the purpose of eliminating the pus cavity, which is particularly suitable for patients who cannot tolerate surgery or are unwilling to undergo surgical treatment.[8] A study conducted by Raza et al concluded that operating patients early with T.B empyema thoracis carries similar results if compared to those operated at a later stage.[9] A study conducted by Jen et al, the treatment outcome of tuberculous empyema is less satisfactory than that of pulmonary tuberculosis, however, modem multidrug chemotherapy with repeated drainage and opportune surgical interventions could be in prospect of successful treatment of tuberculous empyema.[10] In addition, it was observed that surgical intervention can be avoided with this line of management along with early recognition and initiation of treatment.

CONCLUSION

The case report described a patient with TB empyema managed in a unique manner with ATT under NTEP along with intrapleural administration of antibiotic. Treatment was designed to provide a timely cure without inducing drug resistance and without resorting to major surgery.

Hence, it can be concluded that combined oral plus intrapleural anti-TB drugs, along with tube thoracostomy can be a better option in treating TB empyema cases.

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