Case Report

ISSN: 1735-0344 *Tanaffos 2024; 23(3): 304-307*

TANAFFOS

Thoracoplasty: A Collapse Therapy for Extra-Pulmonary Drug-Resistant Tuberculosis with Persistent Bronchopleural Fistula and Empyema Cavity

Klein Dantis [1], Chandan Kumar Dey [2], Roopali Phuli [2], Vinod Kumar Ramavath [2]

[1] Department of Cardiothoracic and Vascular Surgery, All India Institute of Medical Sciences, Bathinda, India,
[2] Department of Trauma and Emergency Medicine, All India Institute of Medical Sciences, Raipur, India

Received: 11 July 2022
Accepted: 5 February2024

Correspondence to: Dantis K
Address: Department of Cardiothoracic and Vascular Surgery, All India Institute of Medical Sciences, Bathinda, India
Email address: drkleindantis@yahoo.com

Background: Multi-drug-resistant tuberculosis (MDR-TB) has become a significant health problem worldwide. As per the Global Tuberculosis Report 2021, chemotherapy has only benefitted 59% of individuals. As many patients do not benefit from radical surgery due to their poor pulmonary reserve, bacterial overload, and prognosis, collapse therapy has an essential role in improving the effectiveness of complex anti-tubercular therapy.
Case Presentation: A 35-year-old male with a low body mass index and persistent air leak on an intercostal tube not responding to medical management underwent thoracoscopic decortication. He was diagnosed with multi-drug-resistant tuberculosis (MDR-TB) according to the pleural specimen. Postoperatively, the lung did not seem to expand due to the extensive disease, and the air leak persisted. Hence, he received a short-term MDR-TB regimen and underwent open window thoracostomy followed by limited thoracoplasty for postoperative persistent infected pleural space.
Conclusion: Though pleural MDR-TB is a rare presentation, managing the infected pleural space is challenging as patients tend to have significant morbidity due to various factors.

Keywords: Multi-drug resistant tuberculosis; Bronchopleural fistula; Empyema; Thoracoplasty; Open window thoracostomy

INTRODUCTION

Multi-drug-resistant tuberculosis (MDR-TB) has become a significant health problem worldwide. As per the Global Tuberculosis Report 2021, chemotherapy has only benefitted 59% of individuals (1). Many patients with ineffective chemotherapy for destructive tuberculosis cannot be offered radical surgery due to their poor pulmonary reserve, massive pulmonary foci seeding, and prognosis; hence, collapse therapy is necessary to improve the effectiveness of complex anti-tubercular therapy (2). Here, we describe a rare presentation of MDR-TB diagnosed on pleural tissue (<1%) with persistent empyema and bronchopleural fistula managed by open window thoracostomy initially followed by limited thoracoplasty.

CASE SUMMARIES

A 35-year-old male with left chest pain, recurrent cough, and breathlessness for one week was hemodynamically stable with a body mass index of 17.4 Kg/m^2. His respiratory examination revealed decreased breathing sounds and vocal resonance over the left hemithorax, while his abdominal examination was regular. His blood parameters and renal and liver function tests

were within the normal limit except for his serum albumin (2.2g/dl). Chest x-ray posterior-anterior view revealed left hydropneumothorax (Figure 1a). Thus, a chest tube was inserted under ultrasound guidance.

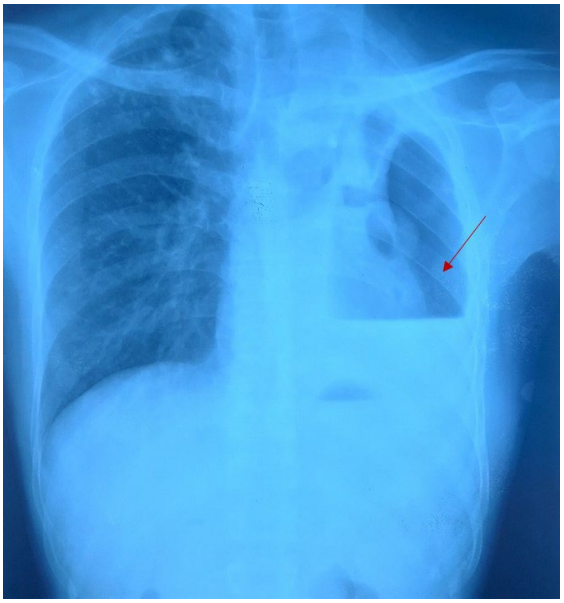

Figure 1a. Chest X-ray posterior-anterior view showing left hydropneumothorax

Computed tomography (CT) of the thorax showed a collapsed and extensively diseased lung with left hydropneumothorax (Figure 1b). His sputum, pleural pus, and bronchoalveolar lavage were negative for bacterial and fungal cultures. He was initially put on intravenous cefoperazone and Sulbactam combination 1.5g twice daily for 7 days, upgraded to piperacillin and tazobactum combination 4.5 g thrice daily for another 7 days. Simultaneously, anti-tubercular therapy (ATT) was initiated based on imaging findings. With persistent air leak and discharge, he underwent thoracoscopic decortication. Fragile diseased lung with multiple bronchopleural fistulae (BPF) (Figure 1c) was mobilized minimally because of the risk of iatrogenic parenchymal injury, followed by pleurectomy and debridement .

Postoperative Genexpert specimen for pleura revealed multidrug-resistant tuberculosis (MDR); hence, he was put on a short-term MDR medication regimen for nine months as per the World Health Organisation (WHO) consolidated guidelines for MDR-TB. As the patient had a persistent air leak, purulent discharge, and non-expansion of lungs postoperatively, open window thoracostomy (OWT) was performed (Figure 1d).

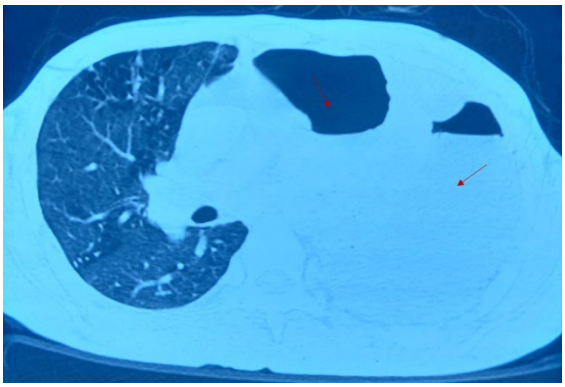

Figure 1b. Computed tomography showing collapsed left lung with hydropneumothorax

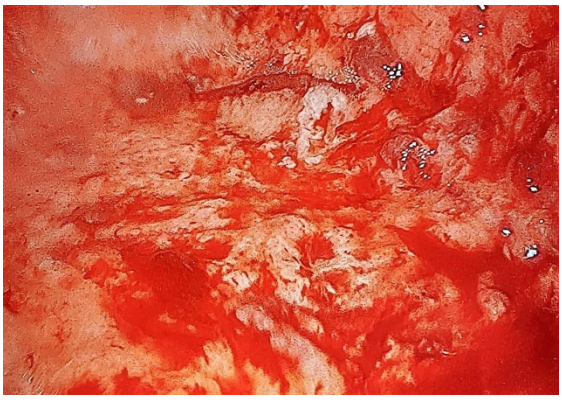

Figure 1c. Intraoperative image of diseased left lung

Figure 1d. Failure of the lung to expand following the decortication procedure

Following the procedure, his general condition, as well as nutritional status, seemed to improve, and discharge from the pleural cavity subsided gradually over six months. However, the lung did not seem to expand, and the OWT site remained patent (Figure 2a); hence, he underwent a space-reducing plasty procedure after six months. The thoracic cavity was obliterated with ribbons of intercostal muscles following partially resected 3 to 8 ribs (Figure 2b), followed by a space-reducing compression dressing over the operated site for 7 days in the hospital and continued further for another 14 days after discharge. The postoperative drain was removed on day 7, and followed by an discharge on day 8. Chest x-rays in the early postoperative period, third, and sixth months showed complete obliteration of thoracic space with no recurrence and deformity (Figure 2c, 2d).

Figure 2a. Patent open window thoracostomy

Figure 2b. Intercostal muscle ribbons obliterating pleural space

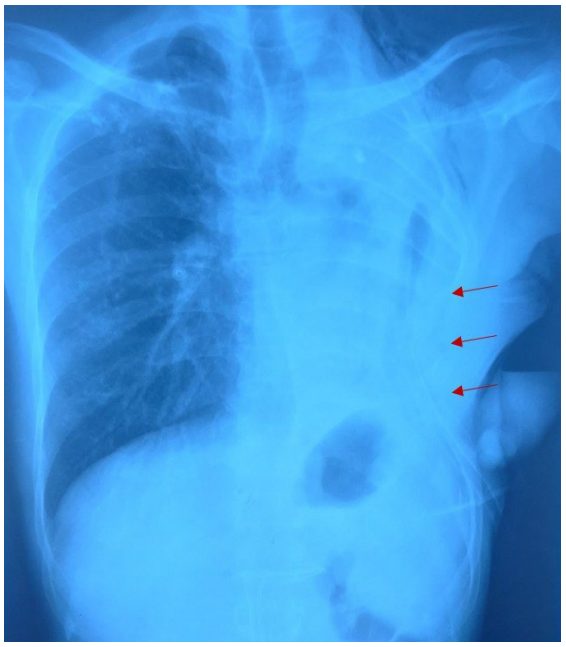

Figure 2c. Post-operative chest X-ray showing obliterated pleural space

Figure 2d. No chest deformity at sixth months follow up

DISCUSSION

Globally, MDR-TB has been associated with high mortality, with 20% deaths during the treatment (1, 3). The universal concern is the suboptimal treatment outcomes, limited access to molecular diagnostic tests, toxic side effects, and complex logistics in many countries (3). Though previously published reports on MDR-TB have

determined the role of chemotherapy and collapse therapy in pulmonary disease; their role in pleural disease is almost anecdotal.

With the advent of chemotherapy for tuberculosis, the thoracoplasty procedure is almost obsolete in many developed countries but is not the same in tropical and developing countries (4,5). Though anti-tubercular therapy is the treatment of choice for active disease, ineffective response and low compliance for chemotherapy make the surgical procedure an alternative (2). In well-localized bilateral disease, the lung with the extensive lesion is targeted; however, with extensive bilateral disease, the chance of a cure becomes minimal as many patients do not tolerate single lung ventilation, and the prognosis is poor (5).

In a scenario with a bilateral diseased lung, persistent purulent discharge, endobronchial disease, and BPF, the role of lung resection again becomes limited due to poor prognosis, morbidity, and bronchial dehiscence at the stump site (5,6). Placement of a chest tube for a prolonged duration is painful, interfering with the patient's daily life activity and leading to psychosocial stress; hence, initial phase with OWT becomes necessary in the mechanical cleansing of the thoracic cavity, followed later by collapse therapy for persistent pleural space (6).

ATT, chest tube, and thoracoscopic decortication in pleural tuberculosis remain the mainstay of treatment (7). However, with persistent empyema, extensively diseased lung, poor nutritional status, and failed decortication procedure, as seen in our case, OWT becomes mandatory to prevent the initial phase of sepsis, followed later by thoracoplasty for persistent space, bacterial seroconversion, closure of BPF and further to improve the effectiveness of anti-tubercular therapy (5, 6).

This case depicts a rare presentation of MDR-TB diagnosed on pleural tissue specimen postoperatively, managed effectively.

Declaration of conflicting interest

The authors declared no potential conflicts of interest concerning the research, authorship, and publication of this article.

Funding

The authors received no funding for the research, authorship, and publication of this article.

Consent

Inform consent obtained from the patient for publication.

REFERENCES

1. World Health Organisation (WHO).Global tuberculosis report 2021.Geneva:WHO;2021.https://www.who.int/tb/publications/global_report/en/
2. Giller DB, Giller GV, Giller BD, Papkov AV, Scherbakova GV, Koroev VV, et al. Case of Video-Assisted Thoracoplasty Application in Pulmonary Tuberculosis Treatment. ***Ann Thorac Surg*** 2020;109(2):e95-e98.
3. Kizito E, Musaazi J, Mutesasira K, Twinomugisha F, Namwanje H, Kiyemba T, et al. Risk factors for mortality among patients diagnosed with multi-drug resistant tuberculosis in Uganda- a case-control study. ***BMC Infect Dis*** 2021;21(1):292.
4. Krasnov DV, Skluev SV, Petrova YK, Skvortsov DA, Krasnov VA, Felker IG, et al. Modern Collapse Therapy for Pulmonary Tuberculosis. ***Thorac Surg Clin*** 2019;29(1):47-58.
5. Marfina GY, Vladimirov KB, Avetisian AO, Starshinova AA, Kudriashov GG, Sokolovich EG, et al. Bilateral cavitary multidrug- or extensively drug-resistant tuberculosis: role of surgery. ***Eur J Cardiothorac Surg*** 2018;53(3):618-24.
6. Dantis K, Kumar Dewan R. Surgical outcomes and the factors affecting lung expansion following open window thoracostomy in chronic tuberculous empyema with destroyed lung. ***Asian Cardiovasc Thorac Ann*** 2022;30(6):696-705.
7. Shaw JA, Irusen EM, Diacon AH, Koegelenberg CF. Pleural tuberculosis: A concise clinical review. ***Clin Respir J*** 2018;12(5):1779-86.