

# Severe Cor Pulmonale Consequence of Pulmonary Tuberculosis Sequelae: A Case Report

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## Abstract

This case report presents a 63-year-old male patient with a history of TB 20 years prior, who developed chronic cor pulmonale, right heart failure, and eventually died. The report emphasizes the serious long-term effects of post-TB sequelae, highlighting diagnostic challenges, clinical progression, and management strategies. The case report addresses a significant and often overlooked aspect of TB management: the long-term complications following TB treatment, known as post-TB sequelae.

## Keywords

Post-Tuberculosis Sequelae, Cor Pulmonale, Case Report

## 1. Introduction

Post-tuberculosis sequelae (PTLD) constitute a challenge to the End TB strategy [1] [2]. The End TB Strategy is a global health initiative launched by the World Health Organization (WHO) in 2014. The strategy aims to end the global tuberculosis (TB) epidemic by 2035. However, PTLD constitutes a challenge and has for a long time not been taken into account as a health problem by the various National tuberculosis programs. The PTLD refers to the evidence of chronic respiratory abnormality, with or without symptoms, attributable at last in part to previous tuberculosis [2]-[6]. Many patients will need treatment for many symptoms several years after TB is declared cured. One of the End TB strategy goals is

to eliminate catastrophic costs related to TB (1). This will not be reached in presence of PTLD involving more use of health care services and a low quality of life [7] [8].

In the low-income countries, like Democratic Republic of Congo (DRC), TB patients experience a long delay to diagnosis and treatment with increase the risk of having pulmonary tuberculosis sequelae after being cured for tuberculosis disease [9].

In 2021, the reported incidence was about 254/100.000 less than 300/100.000 projected by WHO [10]. So many patients were not diagnosed or experienced a delay in their management. This represents a risk for TB sequelae and their consequences [2] [7] [11].

We present a case of chronic cor pulmonale consecutive to lung damage after pulmonary TB treated 20 years ago.

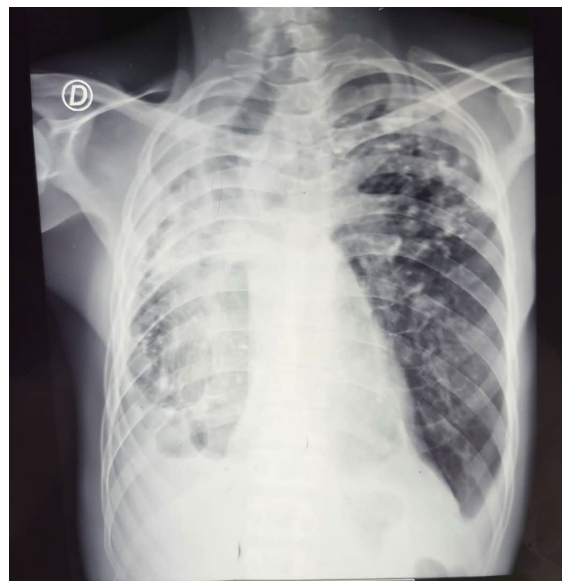
## 2. Case Report

We present a case of chronic cor pulmonale, which belongs to the structural complications of PTLD, consecutive to lung damage after pulmonary TB treated 20 years ago. He is 63 year-old man with a history of pulmonary TB twenty years ago, presented with gradual increasing dyspnea, non-productive cough and low legs edema. There was no history of smoking. He works as a civil servant. We did not find any exposure to fumes or toxic gases. The main physical examination findings were:

Good general state, blood pressure: 101/52 mmHg, Oxygen saturation (SaO<sub>2</sub>): 94%, Respiratory rate: 28/minute; pulse rate: 82 /minute.

We found Jugular vena dilated, Crackles in the two lungs fields and Low legs edema.

Chest X-ray (**Figure 1**).



**Figure 1.** Chest X-ray bilateral alveolar and interstitial shadows with volume loss and retraction of the right lung, calcified nodules on the left lung and gagged trachea.

Chest X-ray: bilateral alveolar interstitial shadows with volume loss and retraction of the right lung, calcified nodules in the left lung and gagged trachea.

Electro-cardiogram (**Figure 2**)

Sinus arrhythmia, premature atrial contraction, T abnormality (flat T), Q abnormality (anterior), right ventricular hypertrophy and incomplete right bundle branch.

Echocardiography (**Figure 3** and **Figure 4**)

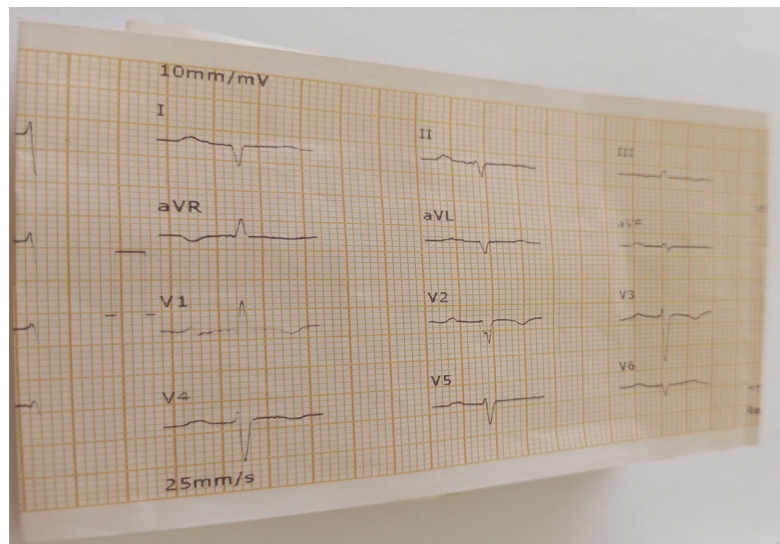
Right cavities (ventricular and atrium) enlargement, thrombus in the right ventricular, pulmonary arterial pressure (PAP): 24 mmHg, inferior vena cava dilated.

Laboratory investigations

ESR (erythrocyte sedimentation rate): 11 mm/1st; Red blood cells: 4.800.000/mm<sup>3</sup>.

Leukocyte count: 4400/mm<sup>3</sup> with normal differential count.

Direct sputum smear (Ziehl-Neelson): no acid fast bacilli and Polymerase chain reaction (Gene-xpert) on sputum was negative (no TB mycobacteria detected).



**Figure 2.** ECG.



**Figure 3.** Echocardiography: dilated right atrium and right ventricle; thrombus in the right ventricle.



**Figure 4.** Echocardiography: inferior vena cava dilated.

Final diagnosis: Chronic Cor Pulmonale with right cardiac failure, severe pulmonary TB sequelae.

The patient management was mainly symptomatic with diuretic (furosemide), enoxaparine (lovenox<sup>R</sup>), amoxicillin + clavulanic acid. On the third day, he developed uncardiogenic shock refractory to dobutamine treatment and died.

### 3. Discussion

Post TB sequelae represent a new paradigm for the TB control (2). It remains a global challenge that has long not been taken into account in the various National Tuberculosis Programs (NTP).

PTLD has been described in 50% - 91% of patients [3] [5] [6] [9] [12]. Predictive factors are not well defined; some appeared like diagnosis and treatment delay, TB reoccurrence, extensive lung involvement [2] [4] [5] [7] [13] [14]. Genetic background can also interfere in healing process, as some patients develop easily fibrosis [4] [5] [15].

Clinical forms of sequelae are very varied [2] [3] [6]-[9].

Structural complications: bronchiectasis, Tracheobronchial stenosis, broncholithiasis, residual cavitation, lung fibrosis, Tuberculoma, pulmonary bronchial arteritis or thrombosis, bronchial pleural fistula, cor pulmonale, pleural, chest wall and mediastinal involvement.

Infections complications: aspergillus fumigatus, TB recurrence, non tuberculosis mycobacteria, pneumonia, empyema, chronic obstructive pulmonary disease.

Psycho-social morbidities: anxiety, depression, social isolation, socio economic impairment, catastrophic costs.

All those damage increase late catastrophic costs [3] [12] [13].

Delay to diagnosis and treatment leads to large pulmonary injuries and high risk of sequelae [4]-[7] [13] [16].

In many cases, pulmonary impairment progress slowly and clinical expression

may appear to late between 15 and 20 years after TB treatment [4] [12]. The case presented experienced TB 20 years ago. This long progression is commonly observed depending with individual factors [4] [5] [7] [8].

Cor pulmonale, in our case, belong to a chronic respiratory failure state. The extension of lung destruction was probably responsible [17] [18].

The management of TB sequelae mainly depends on clinical profile [12]-[14].

We currently have no codified data or validated recommendations regarding the treatment to be offered to patients with PTLTD.

In the event of post-tuberculosis exacerbation, after excluding a relapse of tuberculosis, the most common causes are: bacterial or viral superinfections, aspergilloma, thromboembolic and cardiovascular complications as well as respiratory failure [7] [8].

Therapeutic program of PTLTD must comprise drugs, respiratory rehabilitation, psychosocial and nutritional support. According to the clinical context, bronchodilators (beta-agonists with long action, theophyllins, diuretics, gluco-corticoides) can be used. Respiratory failure needs oxygen, COPD exacerbation with infection will receive antibiotics. In some cases, surgery will be discussed.

There are several proposals for the management of the after-effects of debilitating chronic lung diseases. The management guide provided by the Société de Pneumologie de Langue Française (SPLF) gives interesting suggestions which can also be used for monitoring post-tuberculosis sequelae [19]-[23].

The minimum assessment for any patient who has completed tuberculosis treatment should be biological (hemogram), bacteriological (ziehl, culture), functional (spirometry, 6-minute walk test, respiratory gas analysis) and chest imaging (chest x-ray, optional chest scanner); cardiac assessment would be offered in the event of cardiovascular signs occurring (cardiac ultrasound) looking for pulmonary arterial hypertension and/or chronic cor pulmonale [19].

The proposed duration of PTLTD clinical-radiological monitoring varies depending on patient complaints [20].

In a patient, with persistent dyspnea for 12 weeks, without obvious etiology at the end of the respiratory functional assessment proposed by the SPLF, it is proposed to look for anemia, thromboembolic disease, a cardiac cause, deconditioning, a syndrome of hyperventilation and diaphragmatic pathology. The guide also recommends a chest CT scan and pulmonary function tests [19].

If the dyspnea is persistent and the causes so high have been excluded, it is suggested to carry out an exercise test with measurement of the VO<sub>2</sub>max which allows a multifactorial diagnosis and provides clues, especially in subjects previously in good physical condition, on a single or multifactorial cause of shortness of breath [19].

Respiratory rehabilitation should be offered to patients who remain symptomatic after specialized respiratory assessment, regardless of spirometric and CT data. It allows a rapid improvement in the quality of life of patients. Little data is available on post-TB respiratory rehabilitation.

The use of oxygen therapy must follow validated recommendations for chronic pulmonary pathologies.

It is therefore important that guides specific to the PTLD are developed for optimal care of patients.

In the Democratic Republic of Congo, in the latest tuberculosis management guide (PATI6) published in 2024, some measures were taken [23]:

- any patient who completes tuberculosis treatment must be evaluated for after-effects by imaging and respiratory function tests.
- patients with evidence of PTLD must be evaluated for respiratory rehabilitation and referred to the rehabilitation center.

As a preventive action, traditional TB control activities (prevention, diagnosis and treatment) need to be fine-tuned, and wherever possible to diagnose and manage it as early as possible.

#### 4. Conclusion

TB remains a chronic disease. It is associated with frequent pulmonary damage despite microbiological cure. The fight against tuberculosis should no longer be limited to the prevention and treatment of active tuberculosis cases. PTLD must also be taken into account to reduce its impact and decrease his morbi mortality.

#### Authors Contribution

I.M. Kashongwe: followed the patient and prepared the manuscript.

A.M. Kusompi: followed the patient.

A.P. Okamba: cardiac investigations.

G.M. Ntima: cardiac investigations.

E.V. Kintoki: cardiac investigations.

Z.M. Kashongwe: followed the patient and supervised manuscript preparation.

All the authors revised the final manuscript.

#### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

#### References

- [1] Matteelli, A., Rendon, A., Tiberi, S., Al-Abri, S., Voniatis, C., Carvalho, A.C.C., *et al.* (2018) Tuberculosis Elimination: Where Are We Now? *European Respiratory Review*, **27**, Article ID: 180035. <https://doi.org/10.1183/16000617.0035-2018>
- [2] Visca, D., Centis, R., Munoz-Torrico, M. and Pontali, E. (2020) Post-Tuberculosis Sequelae: The Need to Look Beyond Treatment Outcome. *The International Journal of Tuberculosis and Lung Disease*, **24**, 761-762. <https://doi.org/10.5588/ijtld.20.0488>
- [3] Sotgiu, G., Centis, R. and Migliori, G.B. (2021) Post-Tuberculosis Sequelae and Their Socioeconomic Consequences: Worth Investigating. *The Lancet Global Health*, **9**, e1628-e1629. [https://doi.org/10.1016/s2214-109x\(21\)00454-x](https://doi.org/10.1016/s2214-109x(21)00454-x)
- [4] Martinez-Garcia, M.A., Guan, W., de-la-Rosa, D., Athanazio, R., Oscullo, G., Shi, M., *et al.* (2023) Post-TB Bronchiectasis: From Pathogenesis to Rehabilitation. *The*

- International Journal of Tuberculosis and Lung Disease*, **27**, 175-181.  
<https://doi.org/10.5588/ijtld.22.0566>
- [5] Revendran, J., Patil, K., Nair, G., Uppe, A., Nanda, V., Sawant, S., *et al.* (2018) Long Term Sequelae of Pulmonary Tuberculosis and the Factors Predicting Its Development: A ClinicoRadiological Study. *European Respiratory Journal*, **52**, PA2746.  
<https://doi.org/10.1183/13993003.congress-2018.pa2746>
- [6] Gohar Ali, M., Syed Muhammad, Z., Shahzad, T., Yaseen, A. and Irfan, M. (2018) Post Tuberculosis Sequelae in Patients Treated for Tuberculosis: An Observational Study at a Tertiary Care Center of a High TB Burden Country. *European Respiratory Journal*, **52**, PA2745. <https://doi.org/10.1183/13993003.congress-2018.pa2745>
- [7] Muñoz-Torrico, M., Cid-Juárez, S., Gochicoa-Rangel, L., Torre-Bouscolet, L., Salazar-Lezama, M.A., Villarreal-Velarde, H., *et al.* (2020) Functional Impact of Sequelae in Drug-Susceptible and Multidrug-Resistant Tuberculosis. *The International Journal of Tuberculosis and Lung Disease*, **24**, 700-705. <https://doi.org/10.5588/ijtld.19.0809>
- [8] Hulya, S., Ilknur, N., Karadeniz, G. and Erkan, S. (2022) Clinical Effects of TB Sequelae in Patients with COPD. *The International Journal of Tuberculosis and Lung Disease*, **26**, 363-368. <https://doi.org/10.5588/ijtld.21.0419>
- [9] Rafeah Khan, R., Malik, N.I. and Razaque, A. (2019) Imaging of Pulmonary Post-Tuberculosis Sequelae. *Pakistan Journal of Medical Sciences*, **36**, 575-582.  
<https://doi.org/10.12669/pjms.36.icon-suppl.1722>
- [10] WHO (2022) Global Tuberculosis Report 2022. Geneva.
- [11] Tomono, K. (1998) The Causes of Death of Pulmonary Tuberculosis: Late Sequelae of Pulmonary Tuberculosis. *Kekkaku*, **73**, 751-754.
- [12] Allwood, B.W., van der Zalm, M.M., Amaral, A.F.S., Byrne, A., Datta, S., Egere, U., *et al.* (2020) Post-Tuberculosis Lung Health: Perspectives from the First International Symposium. *The International Journal of Tuberculosis and Lung Disease*, **24**, 820-828. <https://doi.org/10.5588/ijtld.20.0067>
- [13] Menzies, N.A., Quaife, M., Allowood, B.W., *et al.* (2021) Lifetime Burden of Disease Care to Incident Tuberculosis Sequelae. *The Lancet Global Health*, **9**, e1679-e1687.
- [14] Ayari, A., Smadhi, H., Mejri, I., Kamoun, H., Greb, D., Akrouf, I., *et al.* (2015). Management of Pulmonary Tuberculosis Sequelae. *European Respiratory Journal*, **46**, PA2762. <https://doi.org/10.1183/13993003.congress-2015.pa2762>
- [15] Walter, J.B. and Srael, M.S. (1974) Wound Healing in "General Pathology". 4th Edition, Churchill Livingstone, 103-115.
- [16] Crofton, J., Horne, N. and Miller, F. (1999) Clinical Tuberculosis. ELBS Edition, Mc Millan Education LTD, 103.
- [17] Weitzenblum, E. and Chaouat, A. (2009) Cor pulmonale. *Chronic Respiratory Disease*, **6**, 177-185. <https://doi.org/10.1177/1479972309104664>
- [18] McLaughlin, V.V., Archer, S.L., Badesch, D.B., Barst, R.J., Farber, H.W., Lindner, J.R., *et al.* (2009) ACCF/AHA 2009 Expert Consensus Document on Pulmonary Hypertension. *Circulation*, **119**, 2250-2294.  
<https://doi.org/10.1161/circulationaha.109.192230>
- [19] Andrejak, C., Cottin, V., Crestani, B., Debieuvre, D., Gonzalez-Bermejo, J., Morelot-Panzini, C., *et al.* (2021) Guide de prise en charge des séquelles respiratoires post infection à SARS-CoV-2. Propositions de prise en charge élaborées par la Société de Pneumologie de Langue Française. Version du 10 novembre 2020. *Revue des Maladies Respiratoires*, **38**, 114-121. <https://doi.org/10.1016/j.rmr.2020.11.009>
- [20] Laouini, I., Abid, N., Loukil, M., Mokni, A., Badri, I. and Ghrairi, H. (2021) Profil

clinique et radiologique des séquelles de tuberculose thoracique: À propos de 205 cas. *Revue des Maladies Respiratoires Actualités*, **13**, 225.

<https://doi.org/10.1016/j.rmra.2020.11.501>

- [21] Aminata, B.O., Djelo, D.B., Abdoulaye, B.A., Ibrahima, D.A.T., Oury, B.M. and Lantam, S. (2020) Radiological Aspects of Thoracic Tuberculosis Sequellae in Adults at the Pneumophtisiology Department of Ignace Deen National Hospital. *Journal Africain d Imagerie Médicale*, **12**, 100-106.
- [22] Cisse, M.F., Dia Kane, Y., Abessolo, I., Mbaye, F.B.R., Thiam, K. and Toure, N.O. (2020) L'évolution et le devenir des patients avec séquelles de tuberculose thoracique. *Revue des Maladies Respiratoires Actualités*, **12**, 168-169.  
<https://doi.org/10.1016/j.rmra.2019.11.376>
- [23] Ministère de la Santé et Prévention, République Démocratique du Congo (2024) Guide prise en charge de la tuberculose, 6è Edition, Programme national de lutte contre la tuberculose, PATI 6.