

Spontaneous Pneumothorax Complicating Miliary Tuberculosis: About a Case at the “Centre Medical Principal De La Gendarmerie Nationale Du Mali”

Souleymane Coulibaly^{1*}, Marius Pembé Sanou², Kassim Sidibe², Ladj Mohamed Diaby³,
Lassina Diallo³, Daouda Amara Traore³, Salif Kone⁴, Ami Diarra², Salif Sow², Abasse Sanogo³,
Salif Satao⁴, Mamadou Cherif Kante², Mahamadou Coulibaly², Aminata Bagayoko³,
Soumaila Keita²

¹Polyclinique des Armées, Kati, Mali

²Centre Médical Principal de la Gendarmerie Nationale, Bamako, Mali

³Centre Médico-Chirurgical des Armées, Bamako, Mali

⁴Service de Pneumologie CHU Point G, Bamako, Mali

Email: *mansasolomani2@gmail.com

How to cite this paper: Coulibaly, S., Sanou, M.P., Sidibe, K., Diaby, L.M., Diallo, L., Traore, D.A., Kone, S., Diarra, A., Sow, S., Sanogo, A., Satao, S., Kante, M.C., Coulibaly, M., Bagayoko, A. and Keita, S. (2023) Spontaneous Pneumothorax Complicating Miliary Tuberculosis: About a Case at the “Centre Medical Principal De La Gendarmerie Nationale Du Mali”. *Journal of Tuberculosis Research*, 11, 67-73.

<https://doi.org/10.4236/jtr.2023.112007>

Received: May 10, 2023

Accepted: June 18, 2023

Published: June 21, 2023

Copyright © 2023 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Introduction: Spontaneous pneumothorax is a rare but serious complication of tuberculosis. Miliary tuberculosis (MT) is a severe form of tuberculosis secondary to hematogenous spread of *Mycobacterium tuberculosis*. **Objective:** To report a case of MT complicated by pneumothorax. **Methodology:** This was a 25-year-old patient, farmer, followed up at the Pneumo-physiology department of the CHU du Point G for MT whose condition was improving after the introduction of anti-tuberculosis chemotherapy. He consulted again after experiencing chest pain. Clinical and imaging revealed a Spontaneous pneumothorax complicating MT. The treatment combined anti-tuberculosis chemotherapy, chest drainage and respiratory physiotherapy. Outcome was favorable with improvement of clinical and radiological signs. **Conclusion:** Pneumothorax complicating MT requires a reflective diagnostic approach and rapid management to improve its prognosis.

Keywords

Spontaneous Pneumothorax, Miliary Tuberculosis, Antituberculous Chemotherapy, Pleural Drainage, Respiratory Physiotherapy

1. Introduction

Pneumothorax is the presence of air in the pleural space. In the absence of trauma, we speak of “spontaneous” which corresponds to an underlying lung disease and “secondary” when there is an underlying disease [1].

Tuberculosis is an infectious disease with human-to-human transmission caused by Koch’s bacillus [2]. About eight million people develop tuberculosis each year. Two to three million patients die of tuberculosis each year. Pulmonary tuberculosis is still a public health problem today [2].

Miliary tuberculosis (MT) is the most serious form, resulting from the dissemination, most often hematogenous, of *Mycobacterium tuberculosis* throughout the body’s viscera [3]. Once lethal, the prognosis of MT has been transformed by antituberculosis chemotherapy [2] [4]. Pneumothorax is a well-known complication of cavitary tuberculosis but is rarely a complication of acute miliary tuberculosis of the lung [5]. Some forms of tuberculous pneumothorax such as spontaneous pneumothorax can be observed during miliary or on late fibrous sequelae [6].

We report the case of a young patient of 25 years old, presenting a case of spontaneous pneumothorax which is a rare complication of MT.

2. Patient and Observation

This was a 25-year-old patient, farmer, followed up at the Pneumo-physiology department of the Point G University Hospital for miliary tuberculosis (MT). His background includes: A chronic cough of about 02 months not improved by community acquired pneumopathy treatments, accompanied by dirty sputum with fatigability and weight loss. Sputum microscopy was negative. The tuberculin skin test was positive at 18 mm. The diagnosis of MT was suggested based on the standard chest X-ray which showing many micronodules distributed in the lung fields with an appearance similar to grains of millet (**Figure 1**).

A transient improvement in clinical signs was observed after the introduction a month ago of the standard anti-tuberculosis chemotherapy recommended by the WHO based on isoniazid and rifampicin for six months, as well as ethambutol and pyrazinamide for the first two months (RHZE Protocol of the National Tuberculosis Control Plan). He consults us urgently for chest pain. Our interrogation

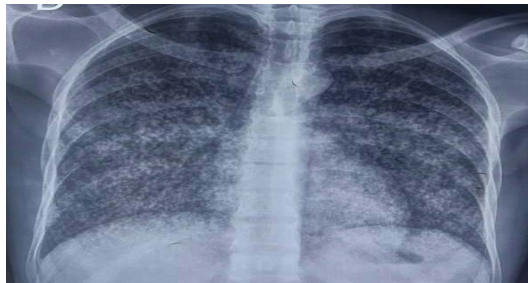


Figure 1. Standard frontal chest x-ray image showing numerous small dots distributed across the lung fields with an appearance similar to grains of millet.

finds chest pain of sudden onset located on the left side accompanied by a dry irritative cough which increases the pain and a notion of slight dyspnea, a notion of unquantified weight loss, headaches, evening fever, chills, great muscle weakness, general malaise for 01 months. Our examination noticed an altered general condition state 3 of WHO classification, a temperature at 38.8°C, a heart rate of 120 beats/min and the patient was polypneic with a respiratory rate of 28 cycles/min. Blood pressure was 100/60 mm Hg, oxygen saturation 92% on room air and severe malnutrition with a body mass index of 18 kg/m.

The thorax was harmonious, with a decrease in expansion on the left side. The vesicular murmur was abolished on the left side.

The transmission of vocal vibrations was abolished on the left hemi thorax.

Percussion on the side of the left thorax indicated tympanism.

The abdomen was soft with moderate hepato-splenomegaly.

The rest of the physical examination was normal.

The standard chest X-ray showed a left pneumothorax of average abundance on MT in the form of avascular hyperclarity with deviation of the trachea and signs of mediastinal displacement to the right (**Figure 2**). The initial biological assessment shows anemia at 8.4 g/dl the number of white blood cells was 12,000/ μ L with 55% lymphocytes and 45% polymorphs. The treatment combines, in addition to resuscitation measures including transfusion blood iso group iso rhesus, a left pleural drainage with evacuation of the air (**Figure 3**). The outcome was favorable with improvement of clinical and radiological signs.

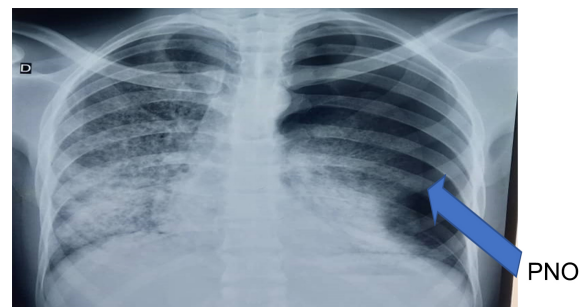


Figure 2. Standard frontal thoracic X-ray image showing a moderately abundant left pneumothorax on MT.

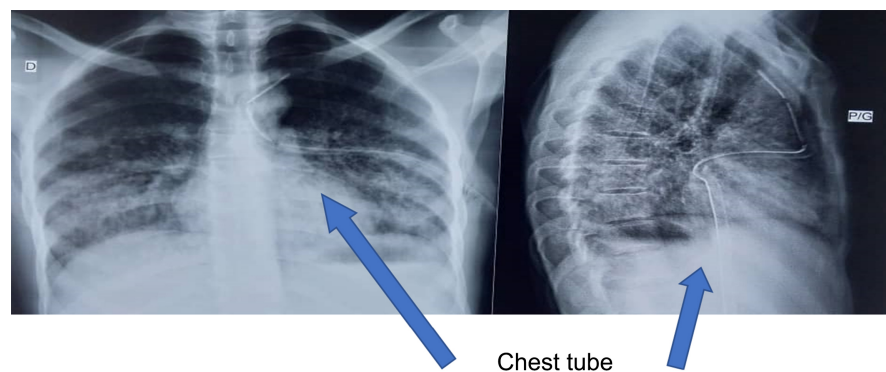


Figure 3. Rx control post left pleural drainage.

3. Discussion

Miliary tuberculosis is a disseminated form of tuberculosis with a distinctive pattern of many small spots distributed throughout the lung fields. Miliary pattern and pneumothorax are rare radiological features in active lung disease [7]. Although pneumothorax is a well-known complication of cavitary tuberculosis, it is rarely seen and potentially fatal in miliary tuberculosis [8]. MT has a lingering respiratory symptomatology evolving in a context of altered general condition and fever [9]. CT scan lesser degree of symptoms, chest X-ray is abnormal in more than 90% of cases; highlighting a miliary appearance in 75% of cases [9]. The appearance of micronodular milia is the most typical and the most frequent [10]. Demonstration of the *Mycobacterium tuberculosis* establishes the definitive diagnosis of MT [11]. Direct sputum microscopy, gastric tubing, KB testing in bronchial aspirate and bronchoalveolar lavage fluid, and skin test are more often negative in MT (40% - 92%) (9). Standard biological examinations are not specific [12]. Tuberculous pneumothorax is a severe form of tuberculosis. It is a complication of post-primary pulmonary tuberculosis. Much more rarely, tuberculous pneumothorax can complicate miliary tuberculosis and, in this case, can be unilateral [13] or bilateral [14]. The spontaneous pneumothorax pathogenesis in cavitary tuberculosis can be explained by the rupture of a cavity in the pleural space [8]. However, the exact pathogenesis of this complication in miliary tuberculosis remains uncertain. The likely mechanism is rupture of confluent subpleural miliary nodules secondary to caseification and necrosis, or rupture of a bullous lesion developed near the miliary tubercles [8]. Pneumothorax may not be seen at the start of therapy but may be seen during TB chemotherapy treatment [15]. Tuberculous pneumothorax affects men more than women; this male predominance is reported by numerous studies [16]. The clinical manifestations combine, to varying degrees, an infectious syndrome, deterioration of the general state, cough, expectoration and dyspnoea. Chest pain is the most consistent symptom, and hemoptysis is very rare [17]. Sometimes anemia, digital clubbing can be noted [18]. The fever may last for a few weeks. Physical examination of the chest reveals reduced mobility of the affected hemi-thorax, tympanism on percussion, reduced or absent breath sounds, tachycardia, and sometimes subcutaneous emphysema. However, in some cases, tuberculous pneumothorax is pauci- or asymptomatic. The standard chest X-ray shows, in the case of pneumothorax, hyper-clarity associated with a lung retracted to its hilum and, in the case of pyopneumothorax, an association of several images: encysted pleural opacities, pleural thickening, fluid level with ipsilateral or bilateral lesions of pulmonary tuberculosis, and rarely images of costal lysis [17]. In addition, chest computed tomography and magnetic resonance imaging can be useful for detecting nodular lesions, skin fistulization, rib osteitis or pleural thickening [18]. The diagnosis of tuberculous pneumothorax is easily evoked when the pneumothorax is associated with parenchymal fibro-cavitary lesions. The treatment of tuberculous pneumothorax is based on:

- effective anti-tuberculosis chemotherapy (**Figure 2**).
- thoracic drainage often guided by ultrasound identification which can allow closure of the bronchopleural fistula after a few months [19].
- washings-aspirations with saline, daily and repeated sometimes using streptokinase.
- adapted and well-monitored physiotherapy.

Surgery is indicated for specific situations. It is then essentially pleural decortication in case of thickened pleura, with an absence of re-expansion of the lung. Lung resections (lobectomy or segmentectomy, or even pneumonectomy) may be necessary to extirpate the destroyed parenchyma. An open window by thoracostomy has been proposed by some authors [20] in cases of persistent empyema (despite well-conducted therapy) associated with a bronchopleural fistula. Some authors have suggested myoplasty (transposition of the pectoral muscle) to treat bronchopleural fistula [21].

Finally, video-assisted thoracic surgery has been useful and effective in treating pleural adhesions, performing biopsies, and even performing Wedge-type lung resections [22].

4. Conclusions

Although relatively uncommon, Spontaneous pneumothorax on MT is a serious form of tuberculosis disease, which can be life-threatening and requires a reflective diagnostic approach and rapid management in order to improve its prognosis.

Primary prevention and early diagnosis of all pulmonary tuberculosis remain the cornerstone of any anti-tuberculosis strategy. Because of compulsory notification of the tuberculosis cases, the carrying out of a screening survey in the entourage of a tuberculosis patient, the vaccination of non-infected contact subjects, the improvement of socio-economic conditions and the fight against promiscuity, we can hope for tuberculosis elimination.

Conflicts of Interest

The authors declare no conflict of interest.

All authors contributed to this work. They read and approved the final version of the manuscript.

The information collected was used for the purposes of the study with the informed consent of the patient, medical secrecy was respected. Therefore, the study does not raise any ethical issues.

References

- [1] Peiken, A.S., Lamberta, F. and Seriff, N.S. (1974) Bilateral Recurrent Pneumothoraces: A Rare Complication of Miliary Tuberculosis. *American Review of Respiratory Disease*, **110**, 512-517.
- [2] Raviglione, M.C. (2003) The TB Epidemic from 1992 to 2002. *Tuberculosis*, **83**, 4-14. [https://doi.org/10.1016/S1472-9792\(02\)00071-9](https://doi.org/10.1016/S1472-9792(02)00071-9)

- [3] Fain, O. (2002) Extrathoracic Tuberculosis. *Revue du Praticien*, **52**, 2127-2132.
- [4] Cherif, J. (2002) Miliare tuberculeuse: Diagnostic et prise en charge. These, Université de Tunis, Tunis.
- [5] Narang, R.K., Kumar, S. and Gupta, A. (1977) Pneumothorax and Pneumomediastinum Complicating Acute Miliary Tuberculosis. *Tubercle*, **58**, 79-82.
[https://doi.org/10.1016/0041-3879\(77\)90033-2](https://doi.org/10.1016/0041-3879(77)90033-2)
- [6] Belmonte, R. and Crowe, H.M. (1995) Pneumothorax in Patients with Pulmonary Tuberculosis. *Clinical Infectious Diseases*, **20**, 1565.
<https://doi.org/10.1093/clinids/20.6.1565>
- [7] Aktoğu, S., Yorgancioglu, A., Cirak, K., Köse, T. and Dereli, S.M. (1996) Clinical Spectrum of Pulmonary and Pleural Tuberculosis: A Report of 5,480 Cases. *European Respiratory Journal*, **9**, 2031-2035.
<https://doi.org/10.1183/09031936.96.09102031>
- [8] Liu, W.L., Wang, H.C., Luh, K.T. and Yang, P.C. (2008) Recurrent Bilateral Pneumothoraces: A Rare Complication of Miliary Tuberculosis. *Journal of the Formosan Medical Association*, **107**, 902-906. [https://doi.org/10.1016/S0929-6646\(08\)60208-9](https://doi.org/10.1016/S0929-6646(08)60208-9)
- [9] Charfi, M.R., Dougui, M.H., Louzir, B., Mestiri, A., Zbiba, M., Belalgia, M.S., et al. (1998) Disseminated Tuberculosis in Non-Immunocompromised Host: Three Case Reports. *La Revue de Médecine Interne*, **19**, 917-920.
[https://doi.org/10.1016/S0248-8663\(99\)80065-4](https://doi.org/10.1016/S0248-8663(99)80065-4)
- [10] Ouedraogo, M., Boncounou, K., Ouedraogo, S.M., Lougue, C., Cisse, R., Birba, E., et al. (2001) Miliare tuberculeuse bacillifère: À propos de 44 cas.
- [11] Carbonnelle, B. and Rousselet, M.C. (2002) Biological Diagnosis of Tuberculosis. *Revue du Praticien*, **52**, 2115-2120.
- [12] Stelianides, S., Belmatoug, N. and Fantin, B. (1997) Manifestations and Diagnosis of Extrapulmonary Tuberculosis. *Revue des Maladies Respiratoires*, **14**, S72-S87.
- [13] Mert, A., Bilir, M., Akman, C., Ozaras, R., Tabak, F., Ozturk, R., et al. (2001) Spontaneous Pneumothorax: A Rare Complication of Miliary Tuberculosis. *Annals of Thoracic and Cardiovascular Surgery*, **7**, 45-48.
<https://doi.org/10.1080/00015458.2001.12098583>
- [14] Sharma, N. and Kumar, P. (2002) Miliary Tuberculosis with Bilateral Pneumothorax: A Rare Complication. *The Indian Journal of Chest Diseases and Allied Sciences*, **44**, 125-127.
- [15] Gupta, P.P., Mehta, D., Agarwal, D. and Chand, T. (2007) Recurrent Pneumothorax Developing during Chemotherapy in a Patient with Miliary Tuberculosis. *Annals of Thoracic Medicine*, **2**, 173-175. <https://doi.org/10.4103/1817-1737.36555>
- [16] Hassine, E., Marniche, K., Bousnina, S., Rekhis, O., Rabah, B., Mustapha, M.A.B., et al. (2002) Tuberculous Pyothorax. 28 Cases. *Presse Medicale (Paris, France)*, **131**, 921-927.
- [17] Miller, W.T. and MacGregor, R.R. (1978) Tuberculosis: Frequency of Unusual Radiographic Findings. *AJR American Journal of Roentgenology*, **130**, 867-875.
<https://doi.org/10.2214/ajr.130.5.867>
- [18] Weissberg, D. and Refaely, Y. (2000) Pneumothorax: Experience with 1,199 Patients. *Chest*, **117**, 1279-1285. <https://doi.org/10.1378/chest.117.5.1279>
- [19] Woodring, J.H., Vandiviere, H.M., Fried, A.M., Dillon, M.L., Williams, T.D. and Melvin, I.G. (1986) Update: The Radiographic Features of Pulmonary Tuberculosis. *AJR American Journal of Roentgenology*, **146**, 497-506.
<https://doi.org/10.2214/ajr.146.3.497>

- [20] Donath, J. and Khan, F.A. (1984) Tuberculous and Posttuberculous Bronchopleural Fistula: Ten Year Clinical Experience. *Chest*, **86**, 697-703. <https://doi.org/10.1378/chest.86.5.697>
- [21] Weissberg, D. (1982) Empyema and Bronchopleural Fistula. Experience with Open Window Thoracostomy. *Chest*, **82**, 447-450. <https://doi.org/10.1378/chest.82.4.447>
- [22] Pairolero, P.C. and Arnold, P.G. (1980) Bronchopleural Fistula: Treatment by Transposition of Pectoralis Major Muscle. *The Journal of Thoracic and Cardiovascular Surgery*, **79**, 142-145. [https://doi.org/10.1016/S0022-5223\(19\)38017-1](https://doi.org/10.1016/S0022-5223(19)38017-1)