

# **Pneumothorax Occuring during the Final Stage of Treatment in Miliary Tuberculosis Patients**

International Journal of Science and Research Archive, 2023, 09(01), 338–343

<https://doi.org/10.30574/ijrsra.2023.9.1.0432>

**Desdiani Desdiani<sup>1\*</sup>**

<sup>1</sup>Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Serang, Banten, Indonesia

**\*Corresponding author:** Desdiani Desdiani, MD, Ph.D

Publication history: Received on 23 April 2023; revised on 31 May 2023; accepted on 03 June 2023

## Daftar Isi

<b>Daftar Isi</b> .....	2
Manuscript"s submission.....	3
<b>COVER LETTER</b> .....	5
<b>Manuscript Submitted</b> .....	6
Your article is accepted for further publishing process .....	17
IJSRA-2023-0432 Article proof for final check and approval .....	18
Re: IJSRA-2023-0432 Article proof for final check and approval.....	19
Author Queries .....	27
Article Accepted.....	29
Article Published .....	35

## Manuscript's submission

---

Dari: desdiani -

(desdiani@ymail.com)Kepada:

editor@ijsra.net

Tanggal: Selasa, 30 Mei 2023 pukul 10.17 WIB

---

Dear Editor-in-Chief of The International Journal of Science and Research Archive,

We submit a manuscript entitled "Pneumothorax Occurring during the Final Stage of Treatment in Miliary Tuberculosis Patients" for possible publication in the International Journal of Science and Research Archive. Our study is original, has not already been published, and has not and will not be submitted for publication elsewhere as long as it is under consideration by the International Journal of Science and Research Archive. We have read and approved the manuscript and take full responsibility for its content. We do not have a conflict of interest in regard to this study or its funding.

Thank you very much for your attention,

Best regards,

Desdiani Desdiani, MD, PhD



Cover Letter\_Pneumothorax\_ijsra.docx

18.8kB



CASE REPORT\_Pneumothorax\_Final\_ijsra.docx

29.3kB



Figures\_Pneumothorax\_ijsra.do

cx 273.3kB



## COVER LETTER

Dear Editor in Chief of International Journal of Science and Research Archive,

Here, we submit a manuscript entitled “Pneumothorax Occuring during the Final Stage of Treatment in Miliary Tuberculosis Patients” for possible publication in International Journal of Science and Research Archive. Our study is original, has not already been published, and has not and will not be submitted for publication elsewhere as long as it is under consideration by International Journal of Science and Research Archive. We have read and approved the manuscript and take full responsibility for its content. We do not have conflict of interest in regard to this study or its funding.

Thank you very much for your attention,

Best regards,

A handwritten signature in blue ink, appearing to read 'Desdiani Desdiani', with a horizontal line underneath.

Desdiani Desdiani, MD, PhD

Corresponding Author

## **Manuscript Submitted**

### **Pneumothorax Occuring during the Final Stage of Treatment in Miliary Tuberculosis Patients**

**Desdiani Desdiani<sup>1\*</sup>**

<sup>1</sup>Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Serang, Banten, Indonesia

**\*Corresponding author:** Desdiani Desdiani, MD, Ph.D

Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Jalan Raya Jakarta Km.04 Pakupatan, Serang, Banten, Indonesia 42124

Tel +62254280330, Fax: +62254281254

E-mail : [desdiani@ymail.com](mailto:desdiani@ymail.com)

## **Abstract**

Air in the pleural space can cause lung collapse and respiratory discomfort, which can be life-threatening in very ill patients, making pneumothorax a medical emergency. Since tubercle bacilli can travel through the blood to the lungs and other organs, Miliary Tuberculosis (TB) is a disseminated disease that can be lethal. We present a case of a 36-year-old male with Pneumothorax Occuring during the Final Stage of Treatment in Million Tuberculosis Patients. The patient is currently undergoing outpatient treatment of miliary TB for the 11th month and so far his condition is getting better, however was admitted to the emergency unit of the hospital, diagnosed with left pneumothorax based on clinical, laboratory, and radiology showing. In meanwhile, 88% of the room air was saturated with oxygen, necessitating Intensive Care Unit treatment with HFNC FiO<sub>2</sub> 100 Flow 60, followed by high concentration oxygen therapy with a non-rebreathing mask (NRM) of 15 litres/minute. Combivent inhalation and pulmicort inhalation were given every 15 minutes. The family refused to install a water sealed drainage or chest tube in the patient. The patient was also given treatments with ceftriaxone, citicolin, methylprednisolone, omeprazole and the advanced phase of tuberculosis drugs namely Rifampicin 450 mg and Isoniazid 300 mg. On the 6th day of treatment in the ICU, the patient's condition improved and the pneumothorax decreased. In this case, the likelihood of Pneumothorax in patients with miliary tuberculosis needs to be emphasized, as well as the importance of evaluation and strict follow-up to prevent the occurrence of pneumothorax.

**Keywords: Pneumothorax, high oxygen consentration, miliary tuberculosis**

## INTRODUCTION

Due to collapsed lungs, respiratory problems, or circulation issues, pneumothorax can result in a life-threatening emergency. Pneumothorax can be detected from the results of radiographic examinations and treatment depends on the results of radiographic examinations at that time. Treatment depends on timely radiographic examinations. Pneumothorax can be a medical emergency due to the presence of air in the pleural space, causing lung collapse and respiratory distress, especially in critically ill patients.[1,2] The severity of the collapsed lung dictates the pneumothorax's clinical appearance. Both trauma that produces communication through the chest wall and lung rupture of the visceral pleura are potential entry points for air into the pleural cavity.[3] This results in decreased venous return, hypotension, and hypoxia. Pneumothorax can be asymptomatic to potentially life-threatening.[4] Although miliary tuberculosis is a common disease, cases of pneumothorax occurring in Miliary TB patients are rare.[5] Due to the hematogenous spread of tubercle bacilli to the lungs and other organs, miliary tuberculosis is a potentially lethal condition that causes tuberculous foci that are roughly the size of a millet seed (1 to 2 mm) in size. John Jacobus Manget originally used the term "miliary tuberculosis" in 1700 to describe pathological samples with tiny tubercles like millet seeds. Disseminated tuberculosis was described as the infection of the blood, bone marrow, or liver, or as the involvement of two organ locations that are not nearby. A characteristic sign supporting the diagnosis of miliary tuberculosis on a chest radiograph is miliary mottling. Miliary tuberculosis can be pulmonary and extrapulmonary tuberculosis.[6][7]

## CASE

A 36-year-old Indonesian male was admitted to the emergency unit of the hospital with shortness of breath, very severe shortness of breath, difficult to communicate with, decreased consciousness and fever. On physical examination found an increase in respiratory rate, respiratory asymmetrical lung expansion, decreased breath sound intensity. The patient is currently undergoing outpatient treatment for miliary TB for the 11th month and so far his condition is getting better, however was admitted to the emergency unit of the hospital, diagnosed with left pneumothorax and miliary tuberculosis based on clinical, laboratory, and radiology showing (Figure 1). Room air oxygen saturation of 88%, necessitating ICU treatment with HFNC FiO<sub>2</sub> 100 Flow 60, followed by high concentration oxygen therapy utilizing a non-rebreathing mask (NRM) that expels 15 litres/minute. A Albuterol, ipratropium and budesonide inhalations are given every 15 minutes. The patient's family refused to install a water sealed drainage or chest tube on the patient. Laboratory results showed leukocytes 18,580 cells/ $\mu$ l. Blood gas analysis, namely pH 7.33, pCO<sub>2</sub> 64 mmHg, pO<sub>2</sub> 242 mmHg, BE -6.2 mmol/L, HCO<sub>3</sub> 33 mmol/L. The patient was also given treatments with ceftriaxone injection, citicolin injection, methylprednisolone injection, omeprazole and the tuberculosis drugs rifampicin 450 mg and isoniazid 300 mg. The patient was treated in the Intensive Care Unit for 5 days. On the 6th day of treatment in the ICU, the patient's condition improved and the pneumothorax began to decrease from the results of the radiography examination (Figure 2 and 3). The patient was transferred to the inpatient ward, there were no complaints. clinically improved and was scheduled to be discharged. The patient's TB treatment was completed at the end of the 12th month. He had no comorbidities in



his medical history (eg hypertension, diabetes mellitus, autoimmune disease, or malignancy). From his previous history, this patient had suffered from TB about 4 years ago, only took TB medication for 4 months and was never controlled by the pulmonary clinic again. Two years later the patient came to clinic with complaints of coughing for almost 2 months, fever, weight loss of 7 kg. The chest radiograph revealed millet-shaped lesions with characteristic miliary mottling, uniformly distributed distinct lesions of 1 to 2 mm in size, in all lung zones, right atelectasis and extensive fibrosis (Figure 4). The patient was treated for two months with a standard first-line oral regimen of rifampicin 450 mg once daily, isoniazid 300 mg once daily, pyrazinamide 1000 mg once daily, ethambutol 1000 mg once daily (2HRZE), other symptomatic medication and continued TB treatment continuation phase with outpatient care in pulmonary clinic (Figure 5 and 6). In this case, the likelihood of Pneumothorax in patients with miliary tuberculosis needs to be emphasized, as well as the importance of evaluation and strict follow-up to prevent the occurrence of pneumothorax.

## **DISCUSSION**

In individuals with compromised immune systems brought on by comorbidities, malnutrition, usage of corticosteroids, or immunosuppressive medications, miliary tuberculosis is a primary infection.[8] Miliary TB is used to denote all progressive, widespread, hematogenously disseminated forms. Although pneumothorax is a common consequence of tuberculosis, persons with miliary disease seldom have it.[9] Pneumothorax and the miliary pattern are uncommon radiographic findings, with incidences of 1.3% and 1.5%, respectively.[10] Shortness of breath and dry cough are the main features of a pneumothorax also seen in patients with miliary tuberculosis without pneumothorax.[11] Pneumothorax is seen during treatment even if it may not be present at the beginning. This alerts the treating physician to the patient's deteriorating clinical course of miliary tuberculosis when they experience life-threatening shortness of breath as a result of a pneumothorax..

The pathogenesis of pneumothorax in miliary tuberculosis is unclear, but it is possible that the mechanism of caseation or subpleural miliary nodule necrosis and rupture may cause the pneumothorax. Acute miliary spread can cause emphysema changes.[13,14] In miliary tuberculosis, an open thoracotomy should not be performed until the patient has been receiving antituberculosis drugs for at least several weeks. Chest tube insertion is the first line of treatment for patients with subsequent spontaneous pneumothorax..[15] In this case, the patient was on TB treatment for up to 10 months with outpatient care at the pulmonary clinic. The patient's condition at that time had improved, but in the 11th month of treatment, the patient came to the emergency room with a pneumothorax and decreased consciousness.

Excessive coughing brought on by miliary tuberculosis is another cause of pneumothorax because it causes a fast rise in intra-alveolar pressure and simultaneous airway restriction. Air is then directed into the vascular adventitia of the hilus as well as the interstitial tissue of the lung. Mechanism of caseous necrosis with rupture into the pleural space in confluent subpleural miliary nodules. A pneumothorax will result from air leaking into the pleural cavity as a result of this.[16,17]

The haematological changes seen in miliary TB are usually nonspecific. Patients may experience pancytopenia, anemia, leukopenia, leukocytosis, especially lymphocytosis, thrombocytopenia, or thrombocytosis. The most

common hematological abnormality in miliary TB is anemia of chronic disease. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) increases are frequent acute phase reactants. Also discussed are leukemic responses, which might be misinterpreted for leukemia. Disseminated intravascular coagulation (DIC), which is uncommon, frequently occurs in conjunction with MODS and ARDS. [18] In this case, laboratory results showed leukocytes 18,580 cells/ $\mu$ l. Blood gas analysis, namely pH 7.33, pCO<sub>2</sub> 64 mmHg, pO<sub>2</sub> 242 mmHg, BE -6.2 mmol/L, HCO<sub>3</sub> 33 mmol/L, while the results of other blood tests were still within normal limits.

Partial or atypical pneumothorax patients are usually given oxygen therapy. Study of oxygen therapy increasing improvement rates based on small population of secondary spontaneous pneumothorax. The results show that oxygen therapy can increase the resolution rate. The use of routine oxygen therapy in patients with partial or atypical pneumothorax should be considered with caution.[19] In this case the oxygen saturation was 88% room air, hence requiring ICU treatment using HFNC FiO<sub>2</sub> 100 Flow 60, afterward subjected to high oxygen concentration therapy using a non-rebreathing mask (NRM) of 15 litre/minute. Combivent and pulmicort inhalations are given every 15 minutes. The patient's family refused to install a chest tube drain..

We reported one case of pneumothorax occurring during the final stage of treatment in miliary tuberculosis patients. The likelihood of pneumothorax in patients with miliary tuberculosis needs to be emphasized, as well as the importance of evaluation and strict follow-up to prevent the occurrence of pneumothorax. The patient presents with severe shortness of breath due to a pneumothorax, which is a life-threatening emergency, and seeks out the underlying pathology so that it can be managed and treated effectively. This sudden clinical deterioration of miliary TB patients should be noted by treating physicians.

#### **ACKNOWLEDGMENT**

The authors express gratitude to the staff of Bhayangkara Brimob Hospital who have contributed in providing medical data and records as well as all our patient who was involved in this report.

#### **CONFLICT OF INTEREST**

None declare

#### **FUNDING**

No funding was obtained

#### **ETHICAL APPROVAL**

Ethical approval not required

#### **CONSENT**

Written informed consent for the publication of this study was obtained from the patient's family. A copy of the consent form is available upon request.

## REFERENCES

1. Taylor AG, Mielke C, Mongan J. 1. Automated detection of moderate and large pneumothorax on frontal chest X-rays using deep convolutional neural networks: A retrospective study. *PLoS Med.* 2018; 15(11): e1002697
2. Loisel A, Parish JM, Wilkens JA, Jaroszewski DE. Managing iatrogenic pneumothorax and chest tubes. *J Hosp Med.* 2013 Jul;8(7):402-8.
3. Aranguren JT, Ferron FR, Ruiz MC. Endobronchial treatment of persistent pneumothorax in acute respiratory distress syndrome. *Medicina Intensiva.* 2019; 43(8): 516
4. Furuya T, Li T, Yanada M, Toda S. Early chest tube removal after surgery for primary spontaneous pneumothorax. General thoracic and cardiovascular surgery. *Gen Thorac Cardiovasc Surg.* 2019; 67(9):794-799.
5. Gupta PP, Mehta D, Agarwal D, Chand T. Recurrent pneumothorax developing during chemotherapy in a patient with miliary tuberculosis. *Ann Thorac Med.* 2007. 2(4): 173-5.
6. Sharma SK, Mohan A, Sharma A, Mitra DK. Miliary tuberculosis: new insights into an old disease. *Lancet Infect Dis.* 2005 Jul;5(7):415-30.
7. Sahn SA, Neff TA. Miliary tuberculosis. *Am J Med.* 1974 Apr;56(4):494-505.
8. Seaton A, Seaton D, Leitch AG. Clinical feature of tuberculosis. *In Crofton and Douglas`s Respiratory disease* 4th ED. Blackwell science; 1997; 395-422.
9. Wilder RJ, Beacham EG, Ravitch MM. Spontaneous pneumothorax complicating cavitory tuberculosis. *J Thorac Cardiovasc Surg* 1962; 43: 561-573.
10. Aktogu S, Yorgancioglu A, Cirak K, et al. Clinical spectrum of pulmonary and pleural tuberculosis: a report of 5,480 cases. *Eur Respir J* 1996; 9: 2031-2035.
11. SharorIuk. Relationship of spontaneous pneumothorax to pulmonary tuberculosis. *Probl Tuberk* 1979; 4: 66-69.
12. Wammanda RD, Ameh EA, Ali FU. Bilateral pneumothorax complication of miliary tuberculosis in children: Case report and review of literature. *Ann Trop Paediatr* 2003; 23: 149-152.
13. Peiken AS, Lamberta F, Seriff NS. Bilateral recurrent pneumothoraces: A rare complication of miliary tuberculosis. *Am Rev Respir Dis* 1974; 110: 512-517.
14. Chandra KS, Prasad AS, Prasad CE, et al. Recurrent pneumothoraces in miliary tuberculosis. *Trop Geogr Med* 1988; 40: 347-349.
15. Graf-Deuel E, Knoblauch A. Simultaneous bilateral spontaneous pneumothorax. *Chest* 1994; 105: 1142-1146.
16. Tasar MA, Bostonci I, Aslan S, Yilmaz R, Dallar Y. Recurrent pneumothorax in an infant with military tuberculosis. *Tuberk Toraks* 2005;53:394-6.
17. Chandra KS, Prasad AS, Prasad CE, Murthy KJ, Srinivasulu T. Recurrent pneumothoraces in miliary tuberculosis. *Trop Geog Med* 1988;40:347-9.
18. Vohra S, Dhaliwal HS. *Miliary Tuberculosis Shekhar*: StatPearls Publishing; 2022
19. Miliary Tuberculosis Shekhar Vohra; Harpal S. Dhaliwal.

20. Park CB, Moon MH, Jeon HW, Cho DG, Song SW, Won YD, et al. Does oxygen therapy increase the resolution rate of primary spontaneous pneumothorax? *J Thorac Dis* 2017;9(12): 5239-5243.



Figure 1. The present of infiltrates, miliary mottling, uniformly distributed distinct lesions of 1 to 2 mm in size, in almost all lung zones, right atelectasis and extensive fibrosis in both lung.



Figure 2. Fibrosis, atelectasis of right lung, right perihilar fibroinfiltrate



Figure 3. Atelectasis and fibrosis in right lung



Figure 4. Pneumothorax is seen as a region of lucency (dark) around the edge of the lung (left lung). Fibroinfiltrates and pleural effusion in right lung. Attached Endotracheal tube (ETT) with 2 corpus tip above carina.



Figure 5. Atelectasis and fibrosis of the right lung, fibrosis in left lung, compared to the previous chest X-ray, showed improvement.



Figure 6. Atelectasis and fibrosis of the right lung, fibrosis in left lung





## Your article is accepted for further publishing process

---

Dari: editor@ijsra.net

Kepada: desdiani@ymail.com

Tanggal: Kamis, 1 Juni 2023 pukul 12.10 WIB

---

Manuscript No.:

IJSRA-2023-0432

Submitted by:

Desdiani Desdiani

E-mail of Corresponding Author:

desdiani@ymail.com

Article Title:

Pneumothorax Occuring during the Final Stage of Treatment in Miliary Tuberculosis Patients

Status of Article:

Your article is accepted for publication

We already have sent a separate e-mail regarding this with details for submission of required documents as well as Payment of article processing charges. Please check it in your inbox or Spam folder and do the needful.

Regards,  
Editor

Quoting desdiani - <[desdiani@ymail.com](mailto:desdiani@ymail.com)>:

Dear Editor-in-Chief of The International Journal of Science and Research Archive,

We submit a manuscript entitled "Pneumothorax Occurring during the Final Stage of Treatment in Miliary Tuberculosis Patients" for possible publication in the International Journal of Science and Research Archive. Our study is original, has not already been published, and has not and will not be submitted for publication elsewhere as long as it is under consideration by the International Journal of Science and Research Archive. We have read and approved the manuscript and take full responsibility for its content. We do not have a conflict of interest in regard to this study or its funding.

Thank you very much for your attention,

Best regards,

Desdiani Desdiani, MD, PhD

## IJSRA-2023-0432 Article proof for final check and approval

Dari: International Journal of Science and Research Archive (editor@ijsra.net)

Kepada: desdiani@ymail.com

Tanggal: Sabtu, 3 Juni 2023 pukul 22.44 WIB

Dear Author,  
Greetings for the day...

We are grateful for your association with us. Please find herewith attached final edited version (as a word file) of your manuscript (ref no. IJSRA-2023-0432) entitled "~~Pneumothorax Occuring during the Final Stage of Treatment in Miliary Tuberculosis Patients~~" which is accepted for publication in International Journal of Science and Research archive (IJSRA).

Download Author proof copy of your manuscript: <https://ijsra.net/sites/default/files/Attached%20Files/IJSRA-2023-0432%20...>

Download Author query form: <https://ijsra.net/content/downloads>

**Special Note:**

1. Provide the name(s) of authors as First Name (Given name)-Middle Name- Last name (Family name/Surname) for each author and check that all names are accurately spelled. It is important from Indexing purpose.
2. Author should provide 4-6 keywords which is important for indexing.
3. Author should provide an appropriate conclusion to the article. Write conclusion as single para. Conclusion should be concise, informative and can be started with summarizing outcome of the study in 1-2 sentence and ended with one line stating: how this study will benefit to the society and way forward.
4. Provide appropriate statement of ethical approval in the manuscript.
5. Ensure that, all the references appearing in the text should be enlisted at the end in reference section and vice versa.

Without this we will not able to process your manuscript further.

**We hereby request you that,**

1. Read the proof at least thrice, note the errors and make necessary corrections (in blue colored text) to make the manuscript error free.
2. Do not change the format of the word file, just check the spelling and other errors in the attached text part.
3. Use this proof for checking the typesetting, editing, completeness and correctness of the text, tables and figures.
4. Significant changes to the article will only be considered at this stage with permission from the Editor.
5. Make sure that you send final approved copy of article proof along with duly filled Author proof form within 3 days after receipt of this e-mail.
6. **Your manuscript will not be further processed for publication until and unless we receive your final approved article proof and Author query form.**
7. **It is responsibility to author to check each and every word and spelling including italic and normal formatting of specific names. No changes will be accepted after this. If any changes are expected after publication of manuscript, author will have to pay charges accordingly.**

We would appreciate to receive your corrected proof as a word file by e-mail within stipulated time period so that we can process your article quickly and efficiently.

Thank you for submitting your work to this journal.

If you need more information, please do not hesitate to contact us.

With Best Regards,  
Managing Editor  
International Journal of Science and Research archive (IJSRA)  
[editor@ijsra.net](mailto:editor@ijsra.net)

## Re: IJSRA-2023-0432 Article proof for final check and approval

Dari: desdiani - (desdiani@ymail.com)

Kepada: editor@ijsra.net

Tanggal: Senin, 5 Juni 2023 pukul 12.07 WIB

Dear Editor-in-Chief of The International Journal of Science and Research Archieve

We really appreciate your request in recent e-mail. We already have corrected, checked, and confirmed the manuscript. Therefore, we send you the final approved manuscript along with duly filled author proof form through the attachment file in this e-mail.

Thank you for your attention and guidance

Best Regards,

Desdiani Desdiani, MD, PhD

Pada Sabtu, 3 Juni 2023 pukul 22.44.14 WIB, International Journal of Science and Research Archive <editor@ijsra.net> menulis:

Dear Author,  
Greetings for the day...

We are grateful for your association with us. Please find herewith attached final edited version (as a word file) of your manuscript (ref no. IJSRA-2023-0432) entitled "~~Pneumothorax~~ **Occuring during the Final Stage of Treatment in Miliary Tuberculosis Patients**" which is accepted for publication in International Journal of Science and Research archive (IJSRA).

**Download Author proof copy of your manuscript:** <https://ijsra.net/sites/default/files/Attached%20Files/IJSRA-2023-0432%20...>

**Download Author query form:** <https://ijsra.net/content/downloads>

### Special Note:

1. Provide the name(s) of authors as First Name (Given name)-Middle Name- Last name (Family name/Surname) for each author and check that all names are accurately spelled. It is important from Indexing purpose.
2. Author should provide 4-6 keywords which is important for indexing.
3. Author should provide an appropriate conclusion to the article. Write conclusion as single para. Conclusion should be concise, informative and can be started with summarizing outcome of the study in 1-2 sentence and ended with one line stating: how this study will benefit to the society and way forward.
4. Provide appropriate statement of ethical approval in the manuscript.
5. Ensure that, all the references appearing in the text should be enlisted at the end in reference section and vice versa.

Without this we will not able to process your manuscript further.

### We hereby request you that,

1. Read the proof at least thrice, note the errors and make necessary corrections (in blue colored text) to make the manuscript error free.

2. Do not change the format of the word file, just check the spelling and other errors in the attached text part.
3. Use this proof for checking the typesetting, editing, completeness and correctness of the text, tables and figures.
4. Significant changes to the article will only be considered at this stage with permission from the Editor.
5. Make sure that you send final approved copy of article proof along with duly filled Author proof form within 3 days after receipt of this e-mail.
6. **Your manuscript will not be further processed for publication until and unless we receive your final approved article proof and Author query form.**
7. **It is responsibility to author to check each and every word and spelling including italic and normal formatting of specific names. No changes will be accepted after this. If any changes are expected after publication of manuscript, author will have to pay charges accordingly.**

We would appreciate to receive your corrected proof as a word file by e-mail within stipulated time period so that we can process your article quickly and efficiently.

Thank you for submitting your work to this journal.

If you need more information, please do not hesitate to contact us.

With Best Regards,  
Managing Editor  
International Journal of Science and Research archive (IJSRA)  
[editor@ijsra.net](mailto:editor@ijsra.net)



IJSRA-2023-0432 Article Proof.docx  
1.1MB



IJSRA-Authors queries for galley proof form.docx  
127kB



tuberculosis on a chest radiograph is miliary mottling. Miliary tuberculosis can be pulmonary and extrapulmonary tuberculosis.[6][7]

## 2. Case

A 36-year-old Indonesian male was admitted to the emergency unit of the hospital with shortness of breath, very severe shortness of breath, difficult to communicate with, decreased consciousness and fever. On physical examination found an increase in respiratory rate, respiratory asymmetrical lung expansion, decreased breath sound intensity. The patient is currently undergoing outpatient treatment for miliary TB for the 11th month and so far his condition is getting better, however was admitted to the emergency unit of the hospital, diagnosed with left pneumothorax and miliary tuberculosis based on clinical, laboratory, and radiology showing (Figure 1). Room air oxygen saturation of 88%, necessitating ICU treatment with HFNC FiO<sub>2</sub> 100 Flow 60, followed by high concentration oxygen therapy utilizing a non-rebreathing mask (NRM) that expels 15 litres/minute. A Albuterol, ipratropium and budesonide inhalations are given every 15 minutes. The patient's family refused to install a water sealed drainage or chest tube on the patient. Laboratory results showed leukocytes 18,580 cells/ $\mu$ l. Blood gas analysis, namely pH 7.33, pCO<sub>2</sub> 64 mmHg, pO<sub>2</sub> 242 mmHg, BE -6.2 mmol/L, HCO<sub>3</sub> 33 mmol/L. The patient was also given treatments with ceftriaxone injection, citicolin injection, methylprednisolone injection, omeprazole and the tuberculosis drugs rifampicin 450 mg and isoniazid 300 mg. The patient was treated in the Intensive Care Unit for 5 days. On the 6th day of treatment in the ICU, the patient's condition improved and the pneumothorax began to decrease from the results of the radiography examination (Figure 2 and 3). The patient was transferred to the inpatient ward, there were no complaints. Clinically improved and was scheduled to be discharged. The patient's TB treatment was completed at the end of the 12th month. He had no comorbidities in his medical history (eg hypertension, diabetes mellitus, autoimmune disease, or malignancy). From his previous history, this patient had suffered from TB about 4 years ago, only took TB medication for 4 months and was never controlled by the pulmonary clinic again. Two years later the patient came to clinic with complaints of coughing for almost 2 months, fever, weight loss of 7 kg. The chest radiograph revealed millet-shaped lesions with characteristic miliary mottling, uniformly distributed distinct lesions of 1 to 2 mm in size, in all lung zones, right atelectasis and extensive fibrosis (Figure 4). The patient was treated for two months with a standard first-line oral regimen of rifampicin 450 mg once daily, isoniazid 300 mg once daily, pyrazinamide 1000 mg once daily, ethambutol 1000 mg once daily (2HRZE), other symptomatic medication and continued TB treatment continuation phase with outpatient care in pulmonary clinic (Figure 5 and 6). In this case, the likelihood of Pneumothorax in patients with miliary tuberculosis needs to be emphasized, as well as the importance of evaluation and strict follow-up to prevent the occurrence of pneumothorax.



**Figure 1** The present of infiltrates, miliary mottling, uniformly distributed distinct lesions of 1 to 2 mm in size, in almost all lung zones, right atelectasis and extensive fibrosis in both lung





**Figure 2** Fibrosis, atelectasis of right lung, right perihilar fibroinfiltrate



**Figure 3** Atelectasis and fibrosis in right lung



**Figure 4** Pneumothorax is seen as a region of lucency (dark) around the edge of the lung (left lung). Fibroinfiltrates and pleural effusion in right lung. Attached Endotracheal tube (ETT) with 2 corpus tip above carina



**Figure 5** Atelectasis and fibrosis of the right lung, fibrosis in left lung, compared to the previous chest X-ray, showed improvement



**Figure 6** Atelectasis and fibrosis of the right lung, fibrosis in left lung

### 3. Discussion

In individuals with compromised immune systems brought on by comorbidities, malnutrition, usage of corticosteroids, or immunosuppressive medications, military tuberculosis is a primary infection.[8] Miliary TB is used to denote all progressive, widespread, hematogenously disseminated forms. Although pneumothorax is a common consequence of tuberculosis, persons with miliary disease seldom have it.[9] Pneumothorax and the miliary pattern are uncommon radiographic findings, with incidences of 1.3% and 1.5%, respectively.[10] Shortness of breath and dry cough are the main features of a pneumothorax also seen in patients with miliary tuberculosis without pneumothorax.[11] Pneumothorax is seen during treatment even if it may not be present at the beginning. This alerts the treating physician to the patient's deteriorating clinical course of miliary tuberculosis when they experience life-threatening shortness of breath as a result of a pneumothorax..

The pathogenesis of pneumothorax in miliary tuberculosis is unclear, but it is possible that the mechanism of caseation or subpleural miliary nodule necrosis and rupture may cause the pneumothorax. Acute miliary spread can cause emphysema changes.[12, 13,14] In miliary tuberculosis, an open thoracotomy should not be performed until the patient has been receiving antituberculosis drugs for at least several weeks. Chest tube insertion is the first line of treatment for patients with subsequent spontaneous pneumothorax.[15] In this case, the patient was on TB treatment for up to 10 months with outpatient care at the pulmonary clinic. The patient's condition at that time had improved, but in the 11th month of treatment, the patient came to the emergency room with a pneumothorax and decreased consciousness.



Excessive coughing brought on by miliary tuberculosis is another cause of pneumothorax because it causes a fast rise in intra-alveolar pressure and simultaneous airway restriction. Air is then directed into the vascular adventitia of the hilus as well as the interstitial tissue of the lung. Mechanism of caseous necrosis with rupture into the pleural space in confluent subpleural miliary nodules. A pneumothorax will result from air leaking into the pleural cavity as a result of this.[16,17]

The haematological changes seen in miliary TB are usually nonspecific. Patients may experience pancytopenia, anemia, leukopenia, leukocytosis, especially lymphocytosis, thrombocytopenia, or thrombocytosis. The most common hematological abnormality in miliary TB is anemia of chronic disease. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) increases are frequent acute phase reactants. Also discussed are leukemic responses, which might be misinterpreted for leukemia. Disseminated intravascular coagulation (DIC), which is uncommon, frequently occurs in conjunction with MODS and ARDS. [18] In this case, laboratory results showed leukocytes 18,580 cells/ $\mu$ l. Blood gas analysis, namely pH 7.33, pCO<sub>2</sub> 64 mmHg, pO<sub>2</sub> 242 mmHg, BE -6.2 mmol/L, HCO<sub>3</sub> 33 mmol/L, while the results of other blood tests were still within normal limits.

Partial or atypical pneumothorax patients are usually given oxygen therapy. Study of oxygen therapy increasing improvement rates based on small population of secondary spontaneous pneumothorax. The results show that oxygen therapy can increase the resolution rate. The use of routine oxygen therapy in patients with partial or atypical pneumothorax should be considered with caution.[19] In this case the oxygen saturation was 88% room air, hence requiring ICU treatment using HFNC FiO<sub>2</sub> 100 Flow 60, afterward subjected to high oxygen concentration therapy using a non-rebreathing mask (NRM) of 15 litre/minute. Combivent and pulmicort inhalations are given every 15 minutes. The patient's family refused to install a chest tube drain.

---

#### 4. Conclusion

We reported one case of pneumothorax occurring during the final stage of treatment in miliary tuberculosis patients. The likelihood of pneumothorax in patients with miliary tuberculosis needs to be emphasized, as well as the importance of evaluation and strict follow-up to prevent the occurrence of pneumothorax. The patient presents with severe shortness of breath due to a pneumothorax, which is a life-threatening emergency, and seeks out the underlying pathology so that it can be managed and treated effectively. This sudden clinical deterioration of miliary TB patients should be noted by treating physicians.

---

#### Compliance with ethical standards

##### *Acknowledgments*

The authors express gratitude to the staff of Bhayangkara Brimob Hospital who have contributed in providing medical data and records as well as all our patient who was involved in this report.

##### *Statement of ethical approval*

The present research work does not contain any studies performed on animals/humans subjects by any of the authors'.

##### *Statement of informed consent*

Written informed consent for the publication of this study was obtained from the patient's family. A copy of the consent form is available upon request.

---

#### References

- [1] Taylor AG, Mielke C, Mongan J. 1. Automated detection of moderate and large pneumothorax on frontal chest X-rays using deep convolutional neural networks: A retrospective study. *PLoS Med.* 2018; 15(11): e1002697
- [2] Loiselle A, Parish JM, Wilkens JA, Jaroszewski DE. Managing iatrogenic pneumothorax and chest tubes. *J Hosp Med.* 2013 Jul;8(7):402-8.
- [3] Aranguren JT, Ferron FR, Ruiz MC. Endobronchial treatment of persistent pneumothorax in acute respiratory distress syndrome. *Medicina Intensiva.*2019; 43(8): 516

- [4] Furuya T, Li T, Yanada M, Toda S. Early chest tube removal after surgery for primary spontaneous pneumothorax. *General thoracic and cardiovascular surgery. Gen Thorac Cardiovasc Surg.* 2019; 67(9):794-799.
- [5] Gupta PP, Mehta D, Agarwal D, Chand T. Recurrent pneumothorax developing during chemotherapy in a patient with miliary tuberculosis. *Ann Thorac Med.* 2007. 2(4): 173-5.
- [6] Sharma SK, Mohan A, Sharma A, Mitra DK. Miliary tuberculosis: new insights into an old disease. *Lancet Infect Dis.* 2005 Jul;5(7):415-30.
- [7] Sahn SA, Neff TA. Miliary tuberculosis. *Am J Med.* 1974 Apr;56(4):494-505.
- [8] Seaton A, Seaton D, Leitch AG. Clinical feature of tuberculosis. In *Crofton and Douglas's Respiratory disease 4th ED.* Blackwell science; 1997; 395-422.
- [9] Wilder RJ, Beacham EG, Ravitch MM. Spontaneous pneumothorax complicating cavitary tuberculosis. *J Thorac Cardiovasc Surg* 1962; 43: 561-573.
- [10] Aktogu S, Yorgancioglu A, Cirak K, et al. Clinical spectrum of pulmonary and pleural tuberculosis: a report of 5,480 cases. *Eur Respir J* 1996; 9: 2031-2035.
- [11] Sharorluk. Relationship of spontaneous pneumothorax to pulmonary tuberculosis. *Probl Tuberk* 1979; 4: 66-69.
- [12] Wammanda RD, Ameh EA, Ali FU. Bilateral pneumothorax complication of miliary tuberculosis in children: Case report and review of literature. *Ann Trop Paediatr* 2003; 23: 149-152.
- [13] Peiken AS, Lamberta F, Seriff NS. Bilateral recurrent pneumothoraces: A rare complication of miliary tuberculosis. *Am Rev Respir Dis* 1974; 110: 512-517.
- [14] Chandra KS, Prasad AS, Prasad CE, et al. Recurrent pneumothoraces in miliary tuberculosis. *Trop Geogr Med* 1988; 40: 347-349.
- [15] Graf-Deuel E, Knoblauch A. Simultaneous bilateral spontaneous pneumothorax. *Chest* 1994; 105: 1142-1146.
- [16] Tasar MA, Bostonci I, Aslan S, Yilmaz R, Dallar Y. Recurrent pneumothorax in an infant with military tuberculosis. *Tuberk Toraks* 2005;53:394-6.
- [17] Chandra KS, Prasad AS, Prasad CE, Murthy KJ, Srinivasulu T. Recurrent pneumothoraces in miliary tuberculosis. *Trop Geog Med* 1988;40:347-9.
- [18] Vohra S, Dhaliwal HS. *Miliary Tuberculosis Shekhar*: StatPearls Publishing; 2022
- [19] *Miliary Tuberculosis Shekhar* Vohra; Harpal S. Dhaliwal.
- [20] Park CB, Moon MH, Jeon HW, Cho DG, Song SW, Won YD, et al. Does oxygen therapy increase the resolution rate of primary spontaneous pneumothorax? *J Thorac Dis* 2017;9(12): 5239-5243.

**Author Queries**

Title of the Manuscript: Pneumothorax occurring during the final stage of treatment in miliary tuberculosis patients

<b>Queries</b>	<b>Details Required</b>	<b>Author's Response</b>
AQ1	Please check and confirm the type of the article is correct.	check and confirm
AQ2	Please check and confirm the title of the article is correct.	check and confirm
AQ3	Please check and confirm the spellings of all the author names, their sequence, affiliations, corresponding author is correctly indicated and details (e-mail, phone)	check and confirm
AQ4	Please check and confirm that all the keywords given by author are mentioned and correctly spelled.	checked and corrected
AQ5	Please check whether all heading and subheading levels are okay.	check and confirm
AQ6	Please check and confirm that all spellings and grammar in the entire text are correctly used.	check and confirm
AQ7	Please check and confirm that all the punctuation marks are appropriately given.	check and confirm
AQ8	Please check and confirm that all the scientific nomenclature, units, symbols and abbreviations are correctly presented	check and confirm
AQ9	Please check and confirm that all Tables and Figures are included in the manuscript.	check and confirm
AQ10	Please check and confirm that all the caption of Tables and Figures are correctly presented.	check and confirm
AQ11	Please check and confirm that all footnotes of tables are okay.	check and confirm
AQ12	Please check and confirm that all the formulae (if present) are correctly presented.	check and confirm
AQ13	Please check and confirm that statements about 'Compliance with Ethical Standards' and correctly presented before reference section. These include (i) Acknowledgement (compulsory), (ii) Disclosure of conflict of interest (compulsory), (iii) Statement of ethical approval (if any) and (iv) Informed consent (if any).	Checked and corrected
AQ14	Please check and confirm that all the References cited in the text are given in the reference list and vice versa. Please provide details in the list or delete the citation from the text if applicable	check and confirm
AQ15	Please check, whether you want to display author biography or not. If yes then provide Author biography in short (4-5 lines) with passport size photograph at the end of manuscript.	check and confirm

Author should check all above queries. If okay then mention "Checked and Confirmed" in



**IJSRA**

## **International Journal of Science and Research Archive (IJSRA)**

---

the Author's Response column; otherwise, do the necessary changes in the galley proof (in blue color text) and mention "Checked and Corrected" in the Author's Response column.



(CASE REPORT)



## Pneumothorax occurring during the final stage of treatment in miliary tuberculosis patients

Desdiani Desdiani\*

*Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Serang, Banten, Indonesia.*

International Journal of Science and Research Archive, 2023, 09(01), 338–343

Publication history: Received on 23 April 2023; revised on 31 May 2023; accepted on 03 June 2023

Article DOI: <https://doi.org/10.30574/ijrsra.2023.9.1.0432>

### Abstract

Air in the pleural space can cause lung collapse and respiratory discomfort, which can be life-threatening in very ill patients, making pneumothorax a medical emergency. Since tubercle bacilli can travel through the blood to the lungs and other organs, Miliary Tuberculosis (TB) is a disseminated disease that can be lethal. We present a case of a 36-year-old male with Pneumothorax Occurring during the Final Stage of Treatment in Miliary Tuberculosis Patients. The patient is currently undergoing outpatient treatment of miliary TB for the 11th month and so far his condition is getting better, however was admitted to the emergency unit of the hospital, diagnosed with left pneumothorax based on clinical, laboratory, and radiology showing. In meanwhile, 88% of the room air was saturated with oxygen, necessitating Intensive Care Unit treatment with HFNC FiO<sub>2</sub>: 100 Flow 60, followed by high concentration oxygen therapy with a non-rebreathing mask (NRM) of 15 litres/minute. Combivent inhalation and pulmicort inhalation were given every 15 minutes. The family refused to install a water sealed drainage or chest tube in the patient. The patient was also given treatments with ceftriaxone, citicolin, methylprednisolone, omeprazole and the advanced phase of tuberculosis drugs namely Rifampicin 450 mg and Isoniazid 300 mg. On the 6th day of treatment in the ICU, the patient's condition improved and the pneumothorax decreased. In this case, the likelihood of Pneumothorax in patients with miliary tuberculosis needs to be emphasized, as well as the importance of evaluation and strict follow-up to prevent the occurrence of pneumothorax.

**Keywords:** Pneumothorax; High oxygen concentration; Inhaled treatment; Miliary tuberculosis

### 1. Introduction

Due to collapsed lungs, respiratory problems, or circulation issues, pneumothorax can result in a life-threatening emergency. Pneumothorax can be detected from the results of radiographic examinations and treatment depends on the results of radiographic examinations at that time. Treatment depends on timely radiographic examinations. Pneumothorax can be a medical emergency due to the presence of air in the pleural space, causing lung collapse and respiratory distress, especially in critically ill patients.[1,2] The severity of the collapsed lung dictates the pneumothorax's clinical appearance. Both trauma that produces communication through the chest wall and lung rupture of the visceral pleura are potential entry points for air into the pleural cavity.[3] This results in decreased venous return, hypotension, and hypoxia. Pneumothorax can be asymptomatic to potentially life-threatening.[4] Although miliary tuberculosis is a common disease, cases of pneumothorax occurring in Miliary TB patients are rare.[5] Due to the hematogenous spread of tubercle bacilli to the lungs and other organs, miliary tuberculosis is a potentially lethal condition that causes tuberculous foci that are roughly the size of a millet seed (1 to 2 mm) in size. John Jacobus Manget originally used the term "miliary tuberculosis" in 1700 to describe pathological samples with tiny tubercles like millet seeds. Disseminated tuberculosis was described as the infection of the blood, bone marrow, or liver, or as the involvement of two organ locations that are not nearby. A characteristic sign supporting the diagnosis of miliary

\* Corresponding author: Desdiani Desdiani

tuberculosis on a chest radiograph is miliary mottling. Miliary tuberculosis can be pulmonary and extrapulmonary tuberculosis.[6][7]

## 2. Case

A 36-year-old Indonesian male was admitted to the emergency unit of the hospital with shortness of breath, very severe shortness of breath, difficult to communicate with, decreased consciousness and fever. On physical examination found an increase in respiratory rate, respiratory asymmetrical lung expansion, decreased breath sound intensity. The patient is currently undergoing outpatient treatment for miliary TB for the 11th month and so far his condition is getting better, however was admitted to the emergency unit of the hospital, diagnosed with left pneumothorax and miliary tuberculosis based on clinical, laboratory, and radiology showing (Figure 1). Room air oxygen saturation of 88%, necessitating ICU treatment with HFNC FiO<sub>2</sub> 100 Flow 60, followed by high concentration oxygen therapy utilizing a non-rebreathing mask (NRM) that expels 15 litres/minute. A Albuterol, ipratropium and budesonide inhalations are given every 15 minutes. The patient's family refused to install a water sealed drainage or chest tube on the patient. Laboratory results showed leukocytes 18,580 cells/ $\mu$ l. Blood gas analysis, namely pH 7.33, pCO<sub>2</sub> 64 mmHg, pO<sub>2</sub> 242 mmHg, BE -6.2 mmol/L, HCO<sub>3</sub> 33 mmol/L. The patient was also given treatments with ceftriaxone injection, citicolin injection, methylprednisolone injection, omeprazole and the tuberculosis drugs rifampicin 450 mg and isoniazid 300 mg. The patient was treated in the Intensive Care Unit for 5 days. On the 6th day of treatment in the ICU, the patient's condition improved and the pneumothorax began to decrease from the results of the radiography examination (Figure 2 and 3). The patient was transferred to the inpatient ward, there were no complaints. Clinically improved and was scheduled to be discharged. The patient's TB treatment was completed at the end of the 12th month. He had no comorbidities in his medical history (eg hypertension, diabetes mellitus, autoimmune disease, or malignancy). From his previous history, this patient had suffered from TB about 4 years ago, only took TB medication for 4 months and was never controlled by the pulmonary clinic again. Two years later the patient came to clinic with complaints of coughing for almost 2 months, fever, weight loss of 7 kg. The chest radiograph revealed millet-shaped lesions with characteristic miliary mottling, uniformly distributed distinct lesions of 1 to 2 mm in size, in all lung zones, right atelectasis and extensive fibrosis (Figure 4). The patient was treated for two months with a standard first-line oral regimen of rifampicin 450 mg once daily, isoniazid 300 mg once daily, pyrazinamide 1000 mg once daily, ethambutol 1000 mg once daily (2HRZE), other symptomatic medication and continued TB treatment continuation phase with outpatient care in pulmonary clinic (Figure 5 and 6). In this case, the likelihood of Pneumothorax in patients with miliary tuberculosis needs to be emphasized, as well as the importance of evaluation and strict follow-up to prevent the occurrence of pneumothorax.



**Figure 1** The present of infiltrates, miliary mottling, uniformly distributed distinct lesions of 1 to 2 mm in size, in almost all lung zones, right atelectasis and extensive fibrosis in both lung





**Figure 2** Fibrosis, atelectasis of right lung, right perihilar fibroinfiltrate



**Figure 3** Atelectasis and fibrosis in right lung



**Figure 4** Pneumothorax is seen as a region of lucency (dark) around the edge of the lung (left lung). Fibroinfiltrates and pleural effusion in right lung. Attached Endotracheal tube (ETT) with 2 corpus tip above carina



**Figure 5** Atelectasis and fibrosis of the right lung, fibrosis in left lung, compared to the previous chest X-ray, showed improvement



**Figure 6** Atelectasis and fibrosis of the right lung, fibrosis in left lung

### 3. Discussion

In individuals with compromised immune systems brought on by comorbidities, malnutrition, usage of corticosteroids, or immunosuppressive medications, miliary tuberculosis is a primary infection.[8] Miliary TB is used to denote all progressive, widespread, hematogenously disseminated forms. Although pneumothorax is a common consequence of tuberculosis, persons with miliary disease seldom have it.[9] Pneumothorax and the miliary pattern are uncommon radiographic findings, with incidences of 1.3% and 1.5%, respectively.[10] Shortness of breath and dry cough are the main features of a pneumothorax also seen in patients with miliary tuberculosis without pneumothorax.[11] Pneumothorax is seen during treatment even if it may not be present at the beginning. This alerts the treating physician to the patient's deteriorating clinical course of miliary tuberculosis when they experience life-threatening shortness of breath as a result of a pneumothorax.

The pathogenesis of pneumothorax in miliary tuberculosis is unclear, but it is possible that the mechanism of caseation or subpleural miliary nodule necrosis and rupture may cause the pneumothorax. Acute miliary spread can cause emphysema changes.[12, 13,14] In miliary tuberculosis, an open thoracotomy should not be performed until the patient has been receiving antituberculosis drugs for at least several weeks. Chest tube insertion is the first line of treatment for patients with subsequent spontaneous pneumothorax.[15] In this case, the patient was on TB treatment for up to 10 months with outpatient care at the pulmonary clinic. The patient's condition at that time had improved, but in the 11th month of treatment, the patient came to the emergency room with a pneumothorax and decreased consciousness.



Excessive coughing brought on by miliary tuberculosis is another cause of pneumothorax because it causes a fast rise in intra-alveolar pressure and simultaneous airway restriction. Air is then directed into the vascular adventitia of the hilus as well as the interstitial tissue of the lung. Mechanism of caseous necrosis with rupture into the pleural space in confluent subpleural miliary nodules. A pneumothorax will result from air leaking into the pleural cavity as a result of this.[16,17]

The haematological changes seen in miliary TB are usually nonspecific. Patients may experience pancytopenia, anemia, leukopenia, leukocytosis, especially lymphocytosis, thrombocytopenia, or thrombocytosis. The most common hematological abnormality in miliary TB is anemia of chronic disease. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) increases are frequent acute phase reactants. Also discussed are leukemic responses, which might be misinterpreted for leukemia. Disseminated intravascular coagulation (DIC), which is uncommon, frequently occurs in conjunction with MODS and ARDS. [18] In this case, laboratory results showed leukocytes 18,580 cells/ $\mu$ l. Blood gas analysis, namely pH 7.33, pCO<sub>2</sub> 64 mmHg, pO<sub>2</sub> 242 mmHg, BE -6.2 mmol/L, HCO<sub>3</sub> 33 mmol/L, while the results of other blood tests were still within normal limits.

Partial or atypical pneumothorax patients are usually given oxygen therapy. Study of oxygen therapy increasing improvement rates based on small population of secondary spontaneous pneumothorax. The results show that oxygen therapy can increase the resolution rate. The use of routine oxygen therapy in patients with partial or atypical pneumothorax should be considered with caution.[19] In this case the oxygen saturation was 88% room air, hence requiring ICU treatment using HFNC FiO<sub>2</sub> 100 Flow 60, afterward subjected to high oxygen concentration therapy using a non-rebreathing mask (NRM) of 15 litre/minute. Combivent and pulmicort inhalations are given every 15 minutes. The patient's family refused to install a chest tube drain.

---

#### 4. Conclusion

We reported one case of pneumothorax occurring during the final stage of treatment in miliary tuberculosis patients. The likelihood of pneumothorax in patients with miliary tuberculosis needs to be emphasized, as well as the importance of evaluation and strict follow-up to prevent the occurrence of pneumothorax. The patient presents with severe shortness of breath due to a pneumothorax, which is a life-threatening emergency, and seeks out the underlying pathology so that it can be managed and treated effectively. This sudden clinical deterioration of miliary TB patients should be noted by treating physicians.

---

#### Compliance with ethical standards

##### *Acknowledgments*

The authors express gratitude to the staff of Bhayangkara Brimob Hospital who have contributed in providing medical data and records as well as all our patient who was involved in this report.

##### *Statement of informed consent*

Written informed consent for the publication of this study was obtained from the patient's family. A copy of the consent form is available upon request.

---

#### References

- [1] Taylor AG, Mielke C, Mongan J. 1. Automated detection of moderate and large pneumothorax on frontal chest X-rays using deep convolutional neural networks: A retrospective study. *PLoS Med.* 2018; 15(11): e1002697
- [2] Loiseau A, Parish JM, Wilkens JA, Jaroszewski DE. Managing iatrogenic pneumothorax and chest tubes. *J Hosp Med.* 2013 Jul;8(7):402-8.
- [3] Aranguren JT, Ferron FR, Ruiz MC. Endobronchial treatment of persistent pneumothorax in acute respiratory distress syndrome. *Medicina Intensiva.* 2019; 43(8): 516
- [4] Furuya T, Li T, Yanada M, Toda S. Early chest tube removal after surgery for primary spontaneous pneumothorax. *General thoracic and cardiovascular surgery. Gen Thorac Cardiovasc Surg.* 2019; 67(9):794-799.
- [5] Gupta PP, Mehta D, Agarwal D, Chand T. Recurrent pneumothorax developing during chemotherapy in a patient with miliary tuberculosis. *Ann Thorac Med.* 2007. 2(4): 173-5.

- [6] Sharma SK, Mohan A, Sharma A, Mitra DK. Miliary tuberculosis: new insights into an old disease. *Lancet Infect Dis.* 2005 Jul;5(7):415-30.
- [7] Sahn SA, Neff TA. Miliary tuberculosis. *Am J Med.* 1974 Apr;56(4):494-505.
- [8] Seaton A, Seaton D, Leitch AG. Clinical feature of tuberculosis. In *Crofton and Douglas's Respiratory disease 4th ED.* Blackwell science; 1997; 395-422.
- [9] Wilder RJ, Beacham EG, Ravitch MM. Spontaneous pneumothorax complicating cavitary tuberculosis. *J Thorac Cardiovasc Surg* 1962; 43: 561-573.
- [10] Aktogu S, Yorgancioglu A, Cirak K, et al. Clinical spectrum of pulmonary and pleural tuberculosis: a report of 5,480 cases. *Eur Respir J* 1996; 9: 2031-2035.
- [11] Sharorluk. Relationship of spontaneous pneumothorax to pulmonary tuberculosis. *Probl Tuberk* 1979; 4: 66-69.
- [12] Wammanda RD, Ameh EA, Ali FU. Bilateral pneumothorax complication of miliary tuberculosis in children: Case report and review of literature. *Ann Trop Paediatr* 2003; 23: 149-152.
- [13] Peiken AS, Lamberta F, Seriff NS. Bilateral recurrent pneumothoraces: A rare complication of miliary tuberculosis. *Am Rev Respir Dis* 1974; 110: 512-517.
- [14] Chandra KS, Prasad AS, Prasad CE, et al. Recurrent pneumothoraces in miliary tuberculosis. *Trop Geogr Med* 1988; 40: 347-349.
- [15] Graf-Deuel E, Knoblauch A. Simultaneous bilateral spontaneous pneumothorax. *Chest* 1994; 105: 1142-1146.
- [16] Tasar MA, Bostonci I, Aslan S, Yilmaz R, Dallar Y. Recurrent pneumothorax in an infant with miliary tuberculosis. *Tuberk Toraks* 2005;53:394-6.
- [17] Chandra KS, Prasad AS, Prasad CE, Murthy KJ, Srinivasulu T. Recurrent pneumothoraces in miliary tuberculosis. *Trop Geogr Med* 1988;40:347-9.
- [18] Vohra S, Dhaliwal HS. *Miliary Tuberculosis Shekhar*: StatPearls Publishing; 2022
- [19] *Miliary Tuberculosis Shekhar Vohra*; Harpal S. Dhaliwal.
- [20] Park CB, Moon MH, Jeon HW, Cho DG, Song SW, Won YD, et al. Does oxygen therapy increase the resolution rate of primary spontaneous pneumothorax? *J Thorac Dis* 2017;9(12): 5239-5243.

ISSN Approved Journal || eISSN: 2582-8185 || CODEN: IJSRO2 || Impact Factor 8.2 || Google Scholar and CrossRef Indexed  
Fast Publication within 48 hours || Low Article Processing Charges || Peer Reviewed and Referred Journal || Free Certificate

Research and review articles are invited for publication in July - August 2023 (Volume 9, Issue 2)

## About IJSRA

eISSN: 2582-8185

Fast Publication (48 Hrs)

Google Scholar Indexed

CrossRef Indexed

Peer Reviewed Journal

Referred Journal

Low Processing Fee

Free e-Certificate

Free CrossRef DOI

CODEN: IJSRO2

CrossRef

DOI: 10.30574/ijsra

## Pneumothorax occurring during the final stage of treatment in military tuberculosis patients

Desdiani Desdiani \*

Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Serang, Banten, Indonesia.

Research Article

International Journal of Science and Research Archive, 2023, 09(01), 338–343.



Article DOI: 10.30574/ijsra.2023.9.1.0432

DOI url: <https://doi.org/10.30574/ijsra.2023.9.1.0432>

Publication history: Received on 23 April 2023; revised on 31 May 2023; accepted on 03 June 2023

### Abstract:

Air in the pleural space can cause lung collapse and respiratory discomfort, which can be life-threatening in very ill patients, making pneumothorax a medical emergency. Since tubercle bacilli can travel through the blood to the lungs and other organs, Military Tuberculosis (TB) is a disseminated disease that can be lethal. We present a case of a 36-year-old male with Pneumothorax Occuring during the Final Stage of Treatment in Million Tuberculosis Patients. The patient is currently undergoing outpatient treatment of military TB for the 11th month and so far his condition is getting better, however was admitted to the emergency unit of the hospital, diagnosed with left pneumothorax based on clinical, laboratory, and radiology showing. In meanwhile, 88% of the room air was saturated with oxygen, necessitating Intensive Care Unit treatment with HFNC FIO<sub>2</sub> 100 Flow

Link :

<https://ijsra.net/content/pneumothorax-occurring-during-final-stage-treatment-military-tuberculosis-patients>