Spontaneous pneumothorax in a patient with tuberculosis-induced destroyed lung successfully treated with autologous blood and minocycline pleurodesis: a case report

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Background: Spontaneous pneumothorax in a tuberculosis-induced destroyed lung is uncommon and challenging, particularly when surgery poses prohibitive risk. Practical, non-surgical strategies that reliably control persistent air leak are therefore needed.

Case Description: A 48-year-old woman with prior pulmonary tuberculosis and a destroyed right lung presented with right-sided pneumothorax. On arrival, she maintained adequate oxygenation on room air and did not require supplemental oxygen. Despite appropriate chest drainage, a persistent air leak continued for more than 2 weeks. Chemical pleurodesis was performed via the chest tube using a combined regimen of minocycline 100 mg diluted in 50 mL normal saline plus 50 mL autologous blood (total instilled volume 100 mL). Because leakage persisted, a second pleurodesis with the same regimen was performed 48 hours later. Within 24 hours after the second procedure, the air leak ceased. Follow-up chest radiography confirmed re-expansion, the chest tube was removed on day 21, and the patient was discharged without complications. Outpatient follow-up at approximately 2 weeks, 1 month, and 3 months included chest radiographs at the first two visits; no recurrence was observed, and the patient reported satisfactory daily activity without dyspnea beyond baseline.

Conclusions: In high-risk patients with post-tuberculosis destroyed lung and persistent air leak, combined autologous blood and minocycline pleurodesis can provide effective, bedside control and avert surgery. This case details a simple two-step protocol with explicit dosing and timing that may be considered when operative management is unsuitable.

Keywords: Spontaneous pneumothorax; destroyed lung; autologous blood; minocycline; case report

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Introduction

Pulmonary tuberculosis may culminate in a destroyed lung phenotype, predisposing to spontaneous pneumothorax and prolonged air leak. When operative risk is prohibitive, effective non-surgical strategies are essential (1). We present this article in accordance with the CARE reporting checklist (available at https://acr.amegroups.com/article/view/10.21037/acr-2025-151/rc).

Case presentation

On arrival, the patient maintained adequate oxygenation on room air; supplemental oxygen was not required. Chest radiography (*Figure 1*) and computed tomography (*Figure 2*) demonstrated right pneumothorax with extensive fibrotic destruction; a chest tube was inserted (*Figure 3*). The air leak persisted through day 15.

On day 16, pleurodesis was performed via the chest tube using minocycline 100 mg + 50 mL normal saline + 50 mL autologous blood (total 100 mL). Because leakage continued, a second pleurodesis with the same regimen was performed 48 hours later (day 18). Within 24 hours after the second pleurodesis, the air leak ceased; follow-up chest radiography (*Figure 4*) confirmed resolution. The chest tube was removed on day 21, and the patient was discharged in stable condition (see *Table 1*).

Follow-up

Outpatient visits were scheduled at ~2 weeks, 1 month, and 3 months after discharge. Chest radiographs were obtained at the 2-week and 1-month visits; no recurrence was observed through 3 months. The patient reported satisfactory daily activity with no dyspnea beyond baseline.

Patient perspective

"*I agreed to pleurodesis using my own blood and minocycline. I was relieved when the air leak stopped and grateful to avoid surgery. I'm satisfied with the care and recovery.*"

Highlight box

Key findings

- Autologous blood + minocycline pleurodesis resolved a persistent air leak in destroyed lung.
- Exact regimen specified and repeated after 48 hours.
- Adds evidence for non-surgical management in surgically ineligible patients.

What is known and what is new?

- Autologous blood pleurodesis promotes adhesion via fibrin clot formation; minocycline enhances pleural inflammation/fibrosis.
- This case details a practical two-step regimen with explicit dosing and successful cessation of air leak.

What is the implication, and what should change now?

- Consider combined autologous blood and minocycline pleurodesis in high-risk destroyed lung when air leak persists and surgery is unsuitable.

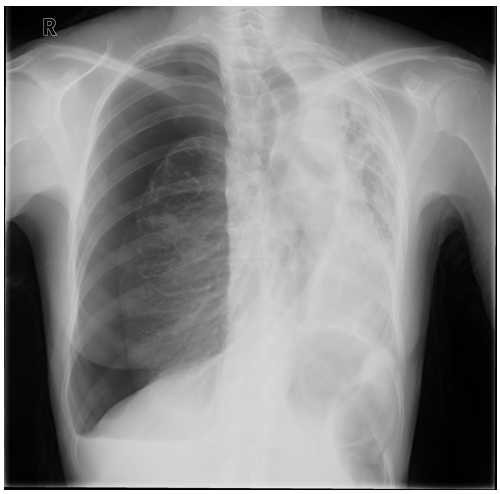

Figure 1 Chest radiograph on admission showing right-sided pneumothorax with severe volume loss and fibrotic changes in the left lung consistent with destroyed lung due to previous pulmonary tuberculosis.

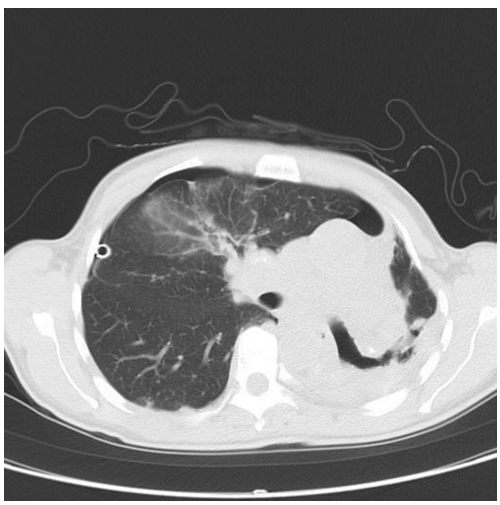

Figure 2 Chest computed tomography demonstrating extensive fibrotic destruction, cavitation, and severe parenchymal loss of the left lung.

Ethics consideration

All procedures performed in this study were in accordance with the Declaration of Helsinki and its subsequent amendments. This study was approved by the institutional ethics committee of Tokyo Women's Medical University

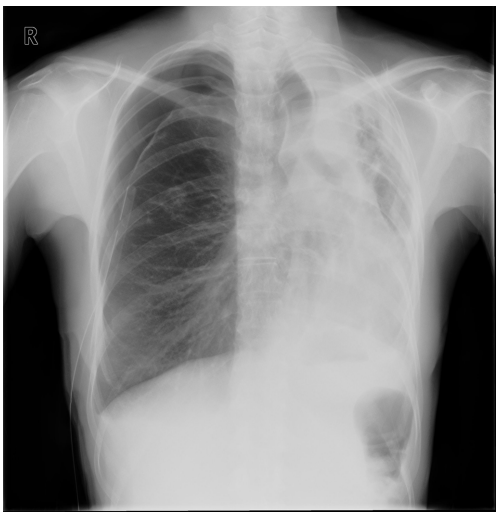

Figure 3 Chest radiograph after chest tube drainage showing persistent pneumothorax despite appropriate tube placement.

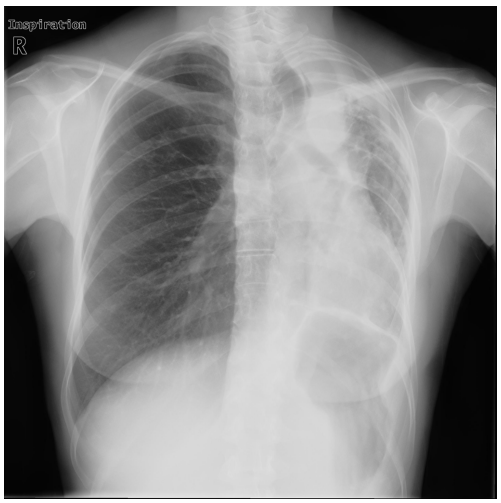

Figure 4 Follow-up chest radiograph after autologous blood and minocycline pleurodesis showing complete resolution of the pneumothorax and full re-expansion of the left lung.

Table 1 Timeline of clinical course

Day/timepoint	Event/intervention	Outcome/notes
Day 0 (ED arrival)	Diagnosis of right pneumothorax; chest tube placed	Adequate oxygenation on room air; no supplemental oxygen required
> Day 0–15	Persistent air leak despite drainage	Continuous bubbling; CT showed destroyed left lung
Day 16	Pleurodesis via chest tube: minocycline 100 mg + 50 mL normal saline + 50 mL autologous blood (total 100 mL)	Air leak persisted; second pleurodesis planned
Day 18 (+48 h)	Second pleurodesis with the same regimen	Air leak ceased within 24 h
Day 21	Chest tube removed	Patient stable; discharged thereafter
Follow-up		
2 weeks	Outpatient visit + chest radiograph	No recurrence
1 month	Outpatient visit + chest radiograph	No recurrence
3 months	Outpatient visit	No recurrence; patient satisfied and active at baseline level

CT, computed tomography; ED, emergency department.

Yachiyo Medical Center (IRB No. 5671). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

Discussion

Autologous blood pleurodesis is a pragmatic option for persistent air leaks, with clot-mediated pleural adhesion (1). Minocycline enhances pleural inflammation/fibrosis (aiding pleurodesis) and, as a broad-spectrum antibiotic, may reduce the risk of secondary infection during the procedure—important in destroyed lung. Reports specifically addressing post-tuberculosis destroyed lung with combined autologous blood + minocycline are limited; this case adds practice-oriented detail (2). Guideline-based principles for spontaneous pneumothorax management should be considered alongside

patient comorbidity and surgical risk (3,4).

Conclusions

Combined autologous blood and minocycline pleurodesis can effectively control persistent air leak in tuberculosis-induced destroyed lung when surgery is high-risk.

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None.

Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at https://acr.amegroups.com/article/view/10.21037/acr-2025-151/rc

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the Declaration of Helsinki and its subsequent amendments. This study was approved by the institutional ethics committee of Tokyo Women's Medical University Yachiyo Medical Center (IRB No. 5671). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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