

## Revisiting an Old Therapy for Tuberculosis

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### Introduction

Artificial, therapeutic pneumothorax was commonly used to treat tuberculosis (TB) prior to the development of antimycobacterial agents. Recent reports<sup>1-2</sup> suggested that therapeutic pneumothorax is efficacious. In 1820, James Carson suggested therapeutic pneumothorax for TB,<sup>3</sup> and Carlo Forlanini began to apply it in clinical practice in 1888.<sup>4</sup> Therapeutic pneumothorax evolved from the idea that collapsing a lung puts it to rest and promotes healing.<sup>5-7</sup> Collapsing diseased portions of lung also prevents the spread of tuberculous material to uninvolved areas.<sup>5-6</sup> Successful therapeutic pneumothorax results in fibrosis and encapsulation of the diseased lung and containment of the infection.<sup>5-6</sup>

### Case Summary

A 96-year-old woman, who was a life-long nonsmoker, was hospitalized for 3 days of persistent and productive cough, then hemoptysis. She denied fever, chills, coryza, dyspnea, night sweats, weight loss, and wheezing. Her medical history included treatment of pulmonary TB in a sanitarium in the 1940s, with right-side therapeutic pneumothorax. After treatment of her TB, her health remained excellent, with no medical problems and no respiratory symptoms while living a very active and productive life as a farmer.

Upon hospitalization for hemoptysis, chest radiograph (Fig. 1) and computed tomogram (Fig. 2) showed pleural thickening and bronchiectasis. Expectored sputum was positive for methicillin-sensitive *Staphylococcus aureus*

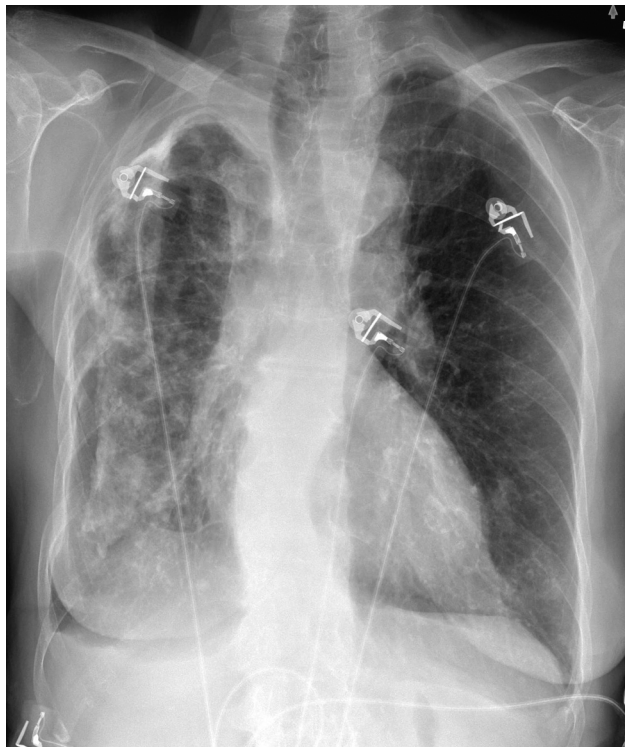


Fig. 1. Chest radiograph shows volume loss and pleural thickening in the right lung.

and negative for acid-fast bacteria. She was treated with trimethoprim-sulfamethoxazole and the symptoms resolved.

### Discussion

In 2006, Motus and colleagues found negative cultures after therapeutic pneumothorax with medical therapy in all new cases, and in 81% of retreatment cases of cavitary TB ( $n = 109$ ).<sup>1</sup> In 2000, Strambu reported favorable outcomes in 3 patients with multiple-drug-resistant TB, treated with therapeutic pneumothorax as an adjuvant to antimycobacterials.<sup>2</sup> Those 3 patients had TB that was resistant to 2 drugs, 3 drugs, and 4 drugs, and they had unilateral pulmonary lesions, so therapeutic pneumothorax was applied.<sup>2</sup> Excellent results were obtained in all 3 cases, with

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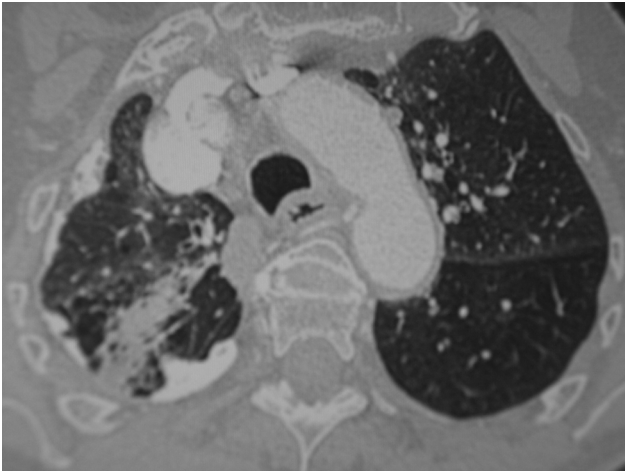


Fig. 2. Computed tomogram shows pleural thickening and bronchiectasis in the right lung.

bacteriologic negativity; all were considered healed after 18 months. The patient with 4-drug resistance required lobectomy.<sup>2</sup>

Early complications from therapeutic pneumothorax include bleeding, lung injury, and tension pneumothorax. Late complications relate to incomplete re-expansion of the lung parenchyma, which leads to extensive pleural thickening and associated fluid accumulation in the residual pocket,<sup>8</sup> which can cause bronchial, esophageal, or chest-wall fistula and infection of the pocket.<sup>9,10</sup> Bronchiectasis due to therapeutic pneumothorax was reported in 1951, and atelectasis was the underlying pathophysiology.<sup>11</sup> Bronchiectasis is frequently reported as a complication of TB,<sup>12</sup> so we do not know if therapeutic pneumothorax was the sole cause of the bronchiectasis in our patient.

With the discovery of antimycobacterial therapy, the use of therapeutic pneumothorax decreased. Lately, a reverse trend has occurred. As the prevalence of multiple-drug-resistant TB increases along with a high rate of antimycobacterial drug adverse effects, therapeutic pneumothorax continues to be a useful adjunct, as it was prior to the development of antimycobacterials. The indications for therapeutic pneumothorax are not clearly defined, but we propose that it should be used in the following circumstances: limited or no availability of antimycobacterials; a

highly drug-resistant TB strain; or intolerable adverse effects to antimycobacterials. The long-term complications of therapeutic pneumothorax are also not clearly described, but therapeutic pneumothorax might contribute to the development of post-TB bronchiectasis.

### Teaching Points

This case illustrates the success of therapeutic pneumothorax for pulmonary TB. Although TB should be considered, new pulmonary infection in patients who have had prior pulmonary TB is usually not a recurrence. Hemoptysis, bronchiectasis, and pleural thickening are long-term complications of pulmonary TB.

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