Fatal Persistent Cavitary *Mycobacterium avium* Complex Pulmonary Disease in a Non-HIV Patient With Prior Malignancy

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Introduction

- *Mycobacterium avium complex* (MAC) pulmonary disease typically follows a chronic course in patients with structural lung abnormalities [1,2]
- Cavitary involvement is associated with more severe disease and poorer outcomes [2,5]
- Treatment requires prolonged multidrug therapy, which can be complicated by medication intolerance and financial barriers [1]
- We present a fatal case of persistent cavitary MAC pulmonary disease in a non-HIV patient with bronchiectasis and prior malignancy

Case Summary

- A 71-year-old woman presented with five to six months of progressive dyspnea, productive cough, weakness, and a 25-pound unintentional weight loss
- Her history included bronchiectasis, colon cancer treated with resection and chemotherapy, and childhood bone cancer requiring lower-extremity amputation
- MAC pulmonary disease was diagnosed approximately 10 years earlier. Treatment was repeatedly interrupted by medication intolerance and financial barriers, with therapy discontinued approximately two years before admission
- Chest CT showed extensive bilateral cavitary disease and bronchiectasis (Figure 2a-d)
  - Sputum cultures grew *Mycobacterium avium* and HIV testing was negative

Treatment & Outcome

- Azithromycin, rifampin, and ethambutol were initiated following infectious disease consultation. Intravenous amikacin was withheld because of renal failure
- Despite treatment, chest radiographs showed worsening bilateral pulmonary infiltrates (Figure 1a–b), accompanied by worsening hypoxemia requiring intubation and mechanical ventilation
- Her course was complicated by septic shock, acute kidney injury, severe metabolic acidosis, and NSTEMI. She died from progressive respiratory and circulatory failure

Imaging

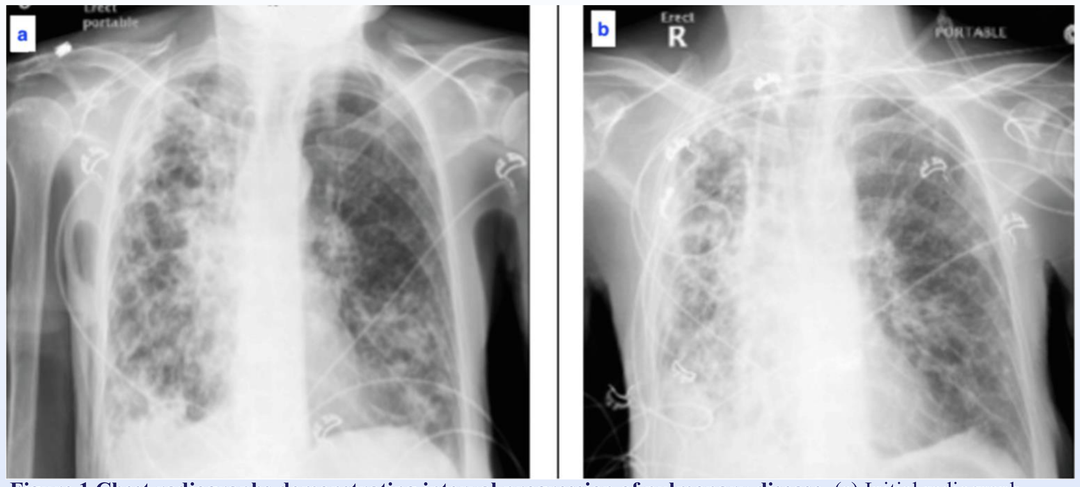


Figure 1 Chest radiographs demonstrating interval progression of pulmonary disease. (a) Initial radiograph demonstrating bilateral pulmonary infiltrates, more prominent in the right lung. (b) Follow-up chest radiograph demonstrating worsening aeration and increasing nodular infiltrates involving the left lingula and left lower lobe.

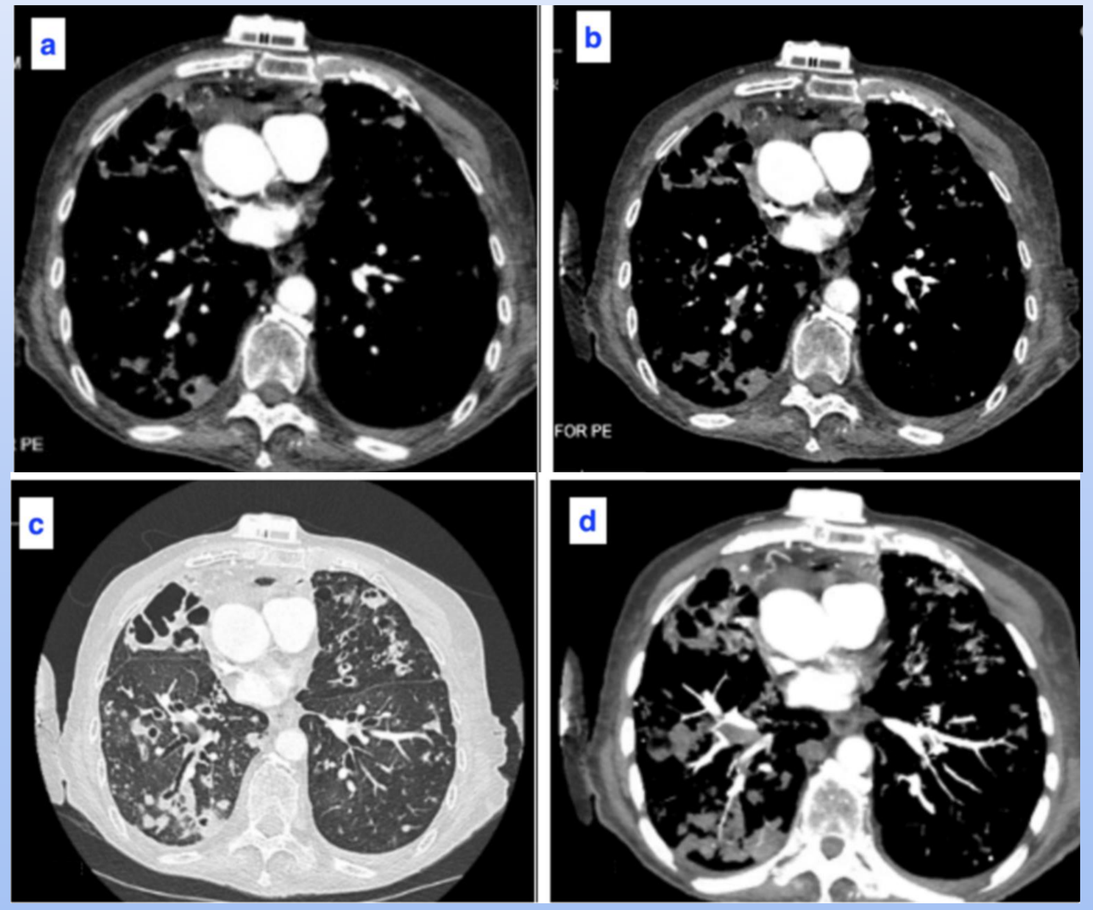


Figure 2: Contrast-enhanced computed tomography (CT) of the chest obtained at admission.
(a–d) Axial CT images demonstrating extensive bilateral cavitary pulmonary lesions, most pronounced in the right lung, with surrounding ground-glass opacities. Numerous bilateral pulmonary nodules, areas of consolidation, and bilateral bronchiectasis are also present. No pleural effusion or pneumothorax is identified.

Discussion

- Bronchiectasis predisposes patients to persistent MAC infection through impaired mucociliary clearance [1]
- Extensive cavitary involvement and advanced age were adverse prognostic features in this patient [2,5,6]
- Medication intolerance and cost prevented sustained treatment. MAC therapy generally continues for at least 12 months after culture conversion, making medication access and tolerance essential to long-term management [1]
- Her prolonged treatment interruption may have contributed to disease persistence and progression. Susceptibility results were unavailable, so macrolide resistance could not be assessed
- Studies have examined associations between solid malignancies and MAC disease, but the contribution of this patient's remote cancers and prior chemotherapy remains uncertain [7]

Conclusion

- Advanced cavitary MAC pulmonary disease can progress to fatal respiratory failure in patients without HIV [2,5,6]
- This case emphasizes early reassessment of worsening symptoms, sustained multidrug therapy, and close follow-up, with attention to medication intolerance and financial barriers [1]

References

1. Daley CL, Iaccarino JM, Lange C, et al.: Treatment of nontuberculous mycobacterial pulmonary disease: an official ATS/ERS/ESCMID/IDSA clinical practice guideline. Clin Infect Dis. 2020, 71:905-13. 10.1093/cid/ciaa1125
2. Hayashi M, Takayanagi N, Kanauchi T, Miyahara Y, Yanagisawa T, Sugita Y: Prognostic factors of 634 HIV-negative patients with Mycobacterium avium complex lung disease. Am J Respir Crit Care Med. 2012, 185:575-83. 10.1164/rccm.201107-1203OC
3. Gochi M, Takayanagi N, Kanauchi T, Ishiguro T, Yanagisawa T, Sugita Y: Retrospective study of the predictors of mortality and radiographic deterioration in 782 patients with nodular/bronchiectatic Mycobacterium avium complex lung disease. BMJ Open. 2015, 5:e008058. 10.1136/bmjopen-2015-008058
4. Fukushima K, Kitada S, Abe Y, et al.: Long-term treatment outcome of progressive Mycobacterium avium complex pulmonary disease. J Clin Med. 2020, 9: 10.3390/jcm9051315
5. Inoue R, Watanabe K, Saigusa Y, et al.: Effect of coexisting advanced extrapulmonary solid cancer on progression of Mycobacterium avium complex lung disease. J Bras Pneumol. 2021, 47:e20200520. 10.36416/1806-3756/e20200520
6. Kamei R, Sawahata M, Yoshizumi N, et al.: Pulmonary mycobacterium avium complex disease complicated by cancer: an 11-year survey at a single-center. J Rural Med. 2021, 16:72-6. 10.2185/jrm.2020-032
7. Gupta K, Feinstein MB, Goldman DA, Patail HS, Stover DE: MAC attack: clinical correlates of Mycobacterium avium complex infection among patients with and without cancer. J Clin Med Res. 2020, 12:142-9. 10.14740/jocmr4058