

Cavitary Pulmonary Metastases From Tongue Cancer Mimicking Pulmonary Tuberculosis: A Case Report

Review began 09/15/2026
Review ended 10/13/2026
Published 10/20/2026

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DOI: 10.7759/cureus.118207

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Abstract

Cavitary lung lesions have a broad differential diagnosis, including infectious, inflammatory, and malignant diseases. A 33-year-old woman presented with hemoptysis and left-sided chest pain 20 months after curative resection of tongue squamous cell carcinoma. Chest computed tomography revealed multiple cavitary lesions in the left upper lobe with surrounding centrilobular nodules and left pleural effusion, raising concern for pulmonary tuberculosis. Three sputum smears for acid-fast bacilli, sputum polymerase chain reaction for *Mycobacterium tuberculosis*, and an interferon-gamma release assay were negative. Despite empirical antibiotic therapy, the pulmonary lesions showed no improvement. Bronchoscopy with transbronchial biopsy demonstrated squamous cell carcinoma morphologically similar to the previous tongue cancer, supporting the diagnosis of pulmonary metastases. Marked radiological improvement was observed after six cycles of pembrolizumab. This case highlights the diagnostic challenge of distinguishing cavitary pulmonary metastases from pulmonary tuberculosis, particularly when cavitary lesions are accompanied by centrilobular nodules, and underscores the importance of histopathological confirmation.

Categories: Radiology, Pulmonology, Oral Medicine

Keywords: bronchoscopy, cavitary lung lesions, pulmonary metastases, pulmonary tuberculosis, squamous cell carcinoma, tongue cancer

Introduction

Cavitary lung lesions present a diagnostic challenge because they may result from bacterial, mycobacterial, or fungal infections, autoimmune disorders, primary lung cancer, or metastatic malignancy [1]. Clinical history, lesion distribution, and accompanying computed tomography (CT) findings can narrow the differential diagnosis; however, radiological findings are frequently nonspecific [1].

Pulmonary metastases typically manifest as multiple round nodules, but atypical appearances, including cavitation, are well recognized [2]. Squamous cell carcinoma is the histological type most commonly associated with cavitating pulmonary metastases [2]. Therefore, cavitation alone does not reliably distinguish infectious disease from metastatic malignancy.

In patients with a history of head and neck squamous cell carcinoma, distinguishing pulmonary metastasis from a second primary lung squamous cell carcinoma can present an additional diagnostic challenge [3]. We describe a patient with previously resected tongue squamous cell carcinoma who developed cavitary lesions in the left upper lobe accompanied by centrilobular nodules, initially raising concern for pulmonary tuberculosis. This case illustrates the diagnostic difficulty caused by overlapping radiological features of infection and metastatic malignancy and highlights the role of bronchoscopy and histopathological examination in establishing the diagnosis.

Case Presentation

A 33-year-old woman presented with hemoptysis and left-sided chest pain. She had never smoked. Twenty months earlier, she had undergone curative resection of tongue squamous cell carcinoma (pT2N0M0, stage II), followed by adjuvant chemotherapy with S-1. At presentation, she was receiving S-1 at 80 mg/day for 2 weeks followed by a 1-week rest period. Her vital signs were within normal limits.

Chest CT revealed multiple cavitary lesions in the left upper lobe, involving segments S1+2 and S3, with surrounding centrilobular nodules and left pleural effusion (Figures 1A, 1B). Laboratory testing demonstrated only a mild elevation in C-reactive protein. Because the radiological findings raised concern for pulmonary infection, particularly pulmonary tuberculosis, an infectious workup was performed. Three consecutive sputum smears for acid-fast bacilli were negative, as was a sputum polymerase chain reaction assay for *Mycobacterium tuberculosis*. An interferon-gamma release assay was also negative. S-1 was discontinued while the newly identified pulmonary abnormalities were being evaluated because their etiology, including infection and malignancy, had not yet been established.

How to cite this article

Hara R, Araya T, Oka K, et al. (October 20, 2026) Cavitary Pulmonary Metastases From Tongue Cancer Mimicking Pulmonary Tuberculosis: A Case Report. Cureus 18(10): e118207. DOI 10.7759/cureus.118207

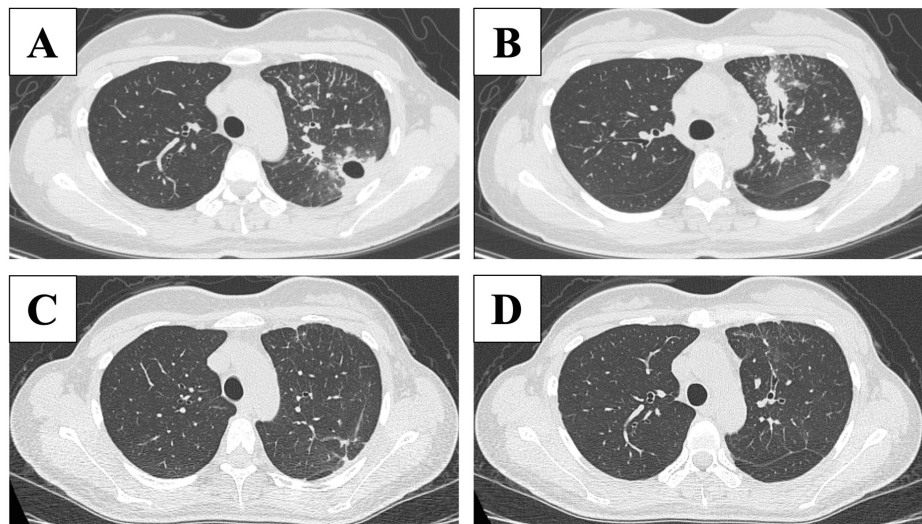


FIGURE 1: Chest computed tomography findings before and after pembrolizumab treatment

(A, B) Chest computed tomography at presentation showing multiple cavitary lesions in the left upper lobe (segments S1+2 and S3), along with left pleural effusion and surrounding centrilobular nodules. (C, D) Chest computed tomography after six cycles of pembrolizumab showing marked radiological improvement.

Empirical treatment for possible bacterial pulmonary infection was initiated with amoxicillin/clavulanate at 1,500 mg/day, with azithromycin at 500 mg/day for the first 3 days. Follow-up CT performed 15 days after the initiation of antibiotic therapy showed no radiological improvement, prompting further investigation.

Positron emission tomography/CT demonstrated increased fluorodeoxyglucose uptake in the cavitary pulmonary lesions, with a maximum standardized uptake value of 15.4, indicating metabolically active lesions but not by itself distinguishing malignancy from infection. Bronchoscopy was subsequently performed. Bronchoalveolar lavage fluid was negative for acid-fast bacilli on smear and polymerase chain reaction testing. Transbronchial biopsy and bronchial brushing were performed from the left B3 bronchus.

Histopathological examination of the transbronchial biopsy specimen demonstrated moderately to poorly differentiated squamous cell carcinoma (Figure 2A). Immunohistochemical staining showed that the tumor cells were positive for p40 and negative for thyroid transcription factor-1 (TTF-1) and Napsin A (Figures 2B-2D). The histological morphology of the pulmonary lesion was similar to that of the previously resected tongue squamous cell carcinoma.

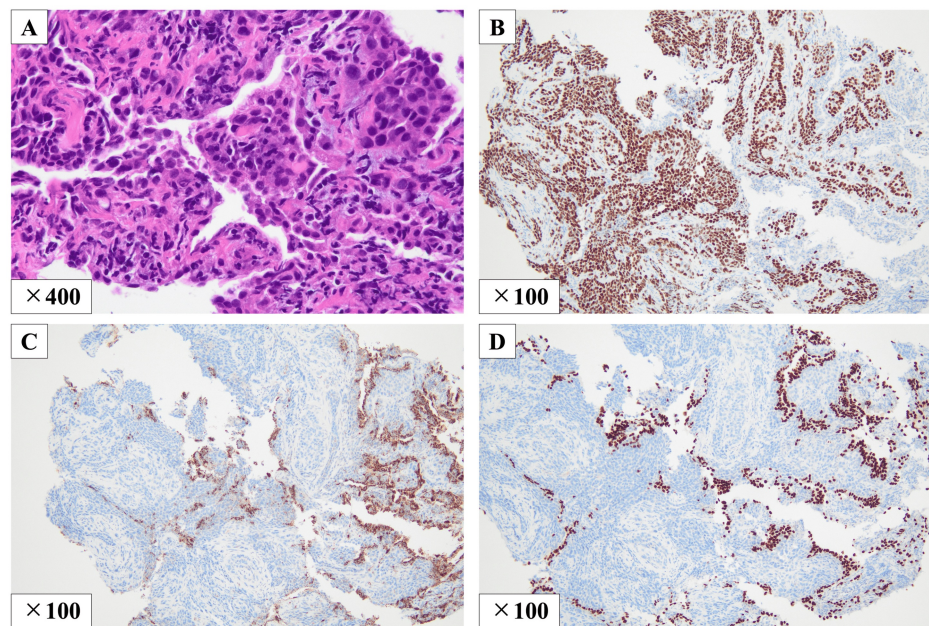


FIGURE 2: Histopathological and immunohistochemical findings of the pulmonary lesion obtained by transbronchial biopsy

Histopathological examination shows moderately to poorly differentiated squamous cell carcinoma. Tumor cells are arranged in sheets and nests with stromal fibrosis. No granulomas are identified. Immunohistochemically, the tumor cells are positive for p40 and negative for Napsin A and thyroid transcription factor-1 (TTF-1). (A) Hematoxylin and eosin staining at $\times 400$. (B) p40 immunohistochemical staining at $\times 100$. (C) Napsin A immunohistochemical staining at $\times 100$. (D) TTF-1 immunohistochemical staining at $\times 100$.

Based on the clinical history, morphological similarity to the previously resected tongue carcinoma, immunohistochemical findings, and overall clinicopathological context, pulmonary metastases from tongue squamous cell carcinoma were considered the most likely diagnosis.

Subsequent mycobacterial cultures of both sputum and bronchoalveolar lavage fluid were negative. Cultures of sputum and bronchoalveolar lavage fluid for common bacteria and fungi were also negative.

Pembrolizumab monotherapy at 200 mg every 3 weeks was initiated. After six cycles, follow-up CT demonstrated marked improvement of the pulmonary lesions (Figures 1C, 1D). The pulmonary lesions remained radiologically stable during subsequent follow-up, and no treatment-related adverse events were observed. However, multiple bone metastases subsequently developed, necessitating a change in systemic therapy.

Discussion

This case demonstrates the diagnostic difficulty of distinguishing cavitary pulmonary metastases from pulmonary tuberculosis when cavitary lesions are accompanied by centrilobular nodules. Cavitary lung lesions have a broad differential diagnosis, including bacterial, mycobacterial, and fungal infections, autoimmune diseases, primary pulmonary malignancies, and metastatic tumors [1]. Although clinical and radiological features may suggest a particular diagnosis, imaging findings alone are often insufficient for definitive differentiation [1].

Cavitation in pulmonary metastases is a recognized phenomenon rather than a unique feature of this case. Squamous cell carcinoma is particularly associated with cavitating pulmonary metastases [2]. Pulmonary metastases from tongue squamous cell carcinoma presenting with cystic or cavitary lesions have also been previously reported [4]. Accordingly, the clinical significance of the present case lies not simply in the occurrence of cavitation but in the combination of cavitary lesions and surrounding centrilobular nodules that led to initial concern for pulmonary tuberculosis.

Centrilobular nodules are a well-recognized CT manifestation of bronchogenic spread of pulmonary tuberculosis [5]. In the present case, the combination of cavitary lesions in the left upper lobe and surrounding centrilobular nodules raised concern for an infectious etiology, particularly pulmonary tuberculosis, but was not specific for infection. Initial investigations, including three sputum acid-fast bacillus smears, *Mycobacterium tuberculosis* polymerase chain reaction testing, and an interferon-gamma

release assay, were negative. However, these negative microbiological and immunological findings did not exclude pulmonary tuberculosis or establish an alternative diagnosis. Follow-up CT performed 15 days after the initiation of empirical antibiotic therapy showed no radiological improvement, prompting further diagnostic evaluation.

The patient's history of tongue cancer remained an important diagnostic consideration despite curative resection 20 months earlier. In patients with previous head and neck squamous cell carcinoma, a pulmonary squamous cell carcinoma may represent either metastatic disease or a second primary lung malignancy, and distinguishing between these entities can be challenging [3]. Immunohistochemical markers such as p40, TTF-1, and Napsin A alone cannot definitively establish the site of origin of a squamous cell carcinoma. In this patient, the morphological similarity between the pulmonary lesion and the previously resected tongue carcinoma, together with the immunohistochemical findings and clinical context, supported pulmonary metastasis from the known tongue squamous cell carcinoma, although these findings alone cannot definitively exclude a second primary pulmonary squamous cell carcinoma.

Bronchoscopy provided tissue and microbiological findings that were instrumental in establishing the diagnosis. Transbronchial biopsy enabled histopathological evaluation of the pulmonary lesion, while bronchoalveolar lavage allowed additional microbiological investigation. When noninvasive investigations do not establish the cause of persistent cavitary lung lesions, tissue sampling should be considered when clinically appropriate.

The marked radiological improvement after six cycles of pembrolizumab was consistent with a treatment response of the pulmonary lesions. Although the pulmonary lesions remained radiologically stable during subsequent follow-up, the development of multiple bone metastases indicated systemic disease progression and necessitated a change in systemic therapy. More broadly, this case emphasizes the importance of integrating oncological history, serial imaging, microbiological findings, and histopathological examination when evaluating cavitary lung disease. Recognizing that metastatic squamous cell carcinoma can resemble pulmonary tuberculosis may facilitate earlier consideration of malignancy and appropriate diagnostic evaluation.

Conclusions

Cavitary pulmonary metastases from squamous cell carcinoma are a recognized phenomenon and should be included in the differential diagnosis of cavitary lung lesions, particularly in patients with a history of head and neck malignancy. Cavities accompanied by centrilobular nodules may suggest pulmonary tuberculosis, but these radiological findings are not specific for infection.

When microbiological investigations are unrevealing and pulmonary lesions fail to improve despite antimicrobial treatment, alternative diagnoses should be reconsidered. Bronchoscopy with microbiological sampling and histopathological examination can play an important role in distinguishing infection from malignancy when noninvasive investigations are inconclusive.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Ryo Hara, Tomoyuki Araya, Kenshiro Oka, Hazuki Takato, Toshiyuki Kita

Acquisition, analysis, or interpretation of data: Ryo Hara

Drafting of the manuscript: Ryo Hara

Critical review of the manuscript for important intellectual content: Ryo Hara, Tomoyuki Araya, Kenshiro Oka, Hazuki Takato, Toshiyuki Kita

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Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the

submitted work.

References

1. Gafoor K, Patel S, Girvin F, et al.: Cavitory lung diseases: a clinical-radiologic algorithmic approach . *Chest*. 2018, 153:1443-65. [10.1016/j.chest.2018.02.026](https://doi.org/10.1016/j.chest.2018.02.026)
2. Seo JB, Im JG, Goo JM, Chung MJ, Kim MY: Atypical pulmonary metastases: spectrum of radiologic findings . *Radiographics*. 2001, 21:403-17. [10.1148/radiographics.21.2.g01mr17403](https://doi.org/10.1148/radiographics.21.2.g01mr17403)
3. Ichinose J, Shinozaki-Ushiku A, Takai D, Fukayama M, Nakajima J: Differential diagnosis between primary lung squamous cell carcinoma and pulmonary metastasis of head and neck squamous cell carcinoma. *Expert Rev Anticancer Ther*. 2016, 16:403-10. [10.1586/14737140.2016.1147352](https://doi.org/10.1586/14737140.2016.1147352)
4. Su HC, Liao CC, Chen CL, Liao WC, Cheng WC: Concurrent aspergillosis and cystic pulmonary metastases in a patient with tongue squamous cell carcinoma. *Open Med (Wars)*. 2022, 17:1325-9. [10.1515/med-2022-0527](https://doi.org/10.1515/med-2022-0527)
5. Im JG, Itoh H: Tree-in-bud pattern of pulmonary tuberculosis on thin-section CT: pathological implications . *Korean J Radiol*. 2018, 19:859-65. [10.3348/kjr.2018.19.5.859](https://doi.org/10.3348/kjr.2018.19.5.859)