



## Lung Adenocarcinoma Presented with Extensive Pulmonary Calcification

CASE  
REPORT

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ABSTRACT

Calcification in lung lesions includes many differential diagnoses and usually indicates a benign course. However, its interpretation is challenging due to many etiologies. Radiological visualization of extensive calcification in bronchogenic carcinoma is not familiar and may cause confusion and misdiagnosis; however, it may be rarely seen and has also been rarely reported. We documented a case of lung adenocarcinoma with extensive calcification in computed tomography (CT) of chest and diagnosed as mucinous adenocarcinoma of the lung by bronchoscopic lung biopsy.

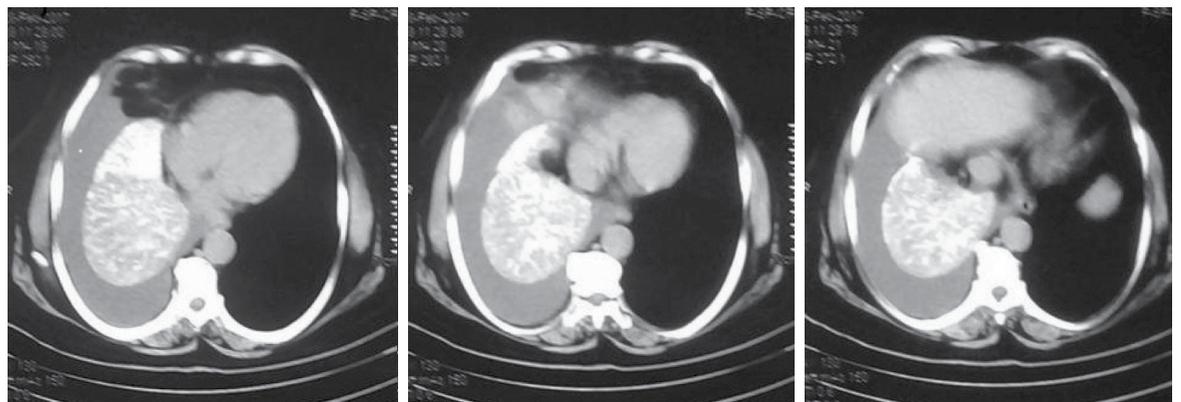
**Keywords:** Lung adenocarcinoma, lung cancer with calcification, calcified adenocarcinoma of lung, lung calcification, pulmonary calcification

### INTRODUCTION

Calcification in lung lesions usually indicates a benign course, especially when the pattern of calcium deposition is of the popcorn, diffuse, laminated, or central type (1). Radiological visualization of extensive calcification in bronchogenic carcinoma is not familiar and may cause confusion and misdiagnosis; (2) however; it may be rarely seen and has also been reported (3).

### CASE REPORT

A 71-year-old female patient complained of exertional dyspnea and dry cough for one year. CT chest showed right-side pleural effusion with underlying lung calcification (Fig. 1). Tuberculin skin test was negative. Pleural fluid aspiration was serosanguinous and exudative. Transthoracic ultrasonography was performed and revealed right massive complex nonseptated pleural effusion, no pleural thickening or nodulation, and a hyperechogenic collapsed lung that favored the presence of calcification (Fig. 2). Pleural fluid cytology revealed atypical cells with adenocarcinoma. The patient underwent bronchoscopy to confirm the diagnosis of malignancy, and the lateral wall of the intermediate bronchus of the right bronchial tree was infiltrated by multiple nodules. It was also circumferentially narrowed. The bronchoscope could not be introduced inside it. Multiple biopsies were obtained from the mucosa of intermediate bronchus for histopathology (Fig. 3), which revealed malignant glandular structures with mucin secretion. Also, solid clusters of atypical cells mixed with scattered psammomatous-like calcification were seen and confirmed the diagnosis of mucinous moderately differentiated adenocarcinoma (Fig. 4).



**Figure 1.** CT chest shows right-side pleural effusion with underlying calcified lung

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**Figure 2.** Transthoracic ultrasound reveals right massive complex nonseptated pleural effusion, no pleural thickening or nodulation, and hyperechogenic collapsed lung

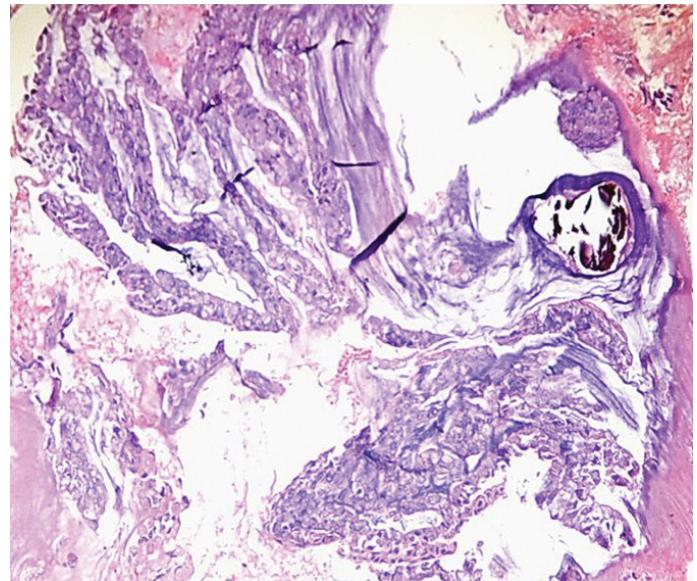


**Figure 3.** Bronchoscopic view of lung mass

## DISCUSSION

Lung carcinoma is often diagnosed late and varies widely in symptoms, pathology, and prognosis (4). Lung adenocarcinoma is often seen in nonsmokers and females (5). It commonly presents as ill-defined lung nodules in chest radiography and can be usually confused with atypical infections (6, 7).

The extent and distribution of calcification are important factors while assessing a solitary pulmonary nodule; however, this is difficult and confusing. Central, solid, and laminated forms of calcification are specific to previous granulomatous infection, such as a tuberculous infection. Popcorn calcification indicates cartilage component in the nodule (e.g., hamartoma and cartilage tumors). Eccentric calcification can present as a calcified granuloma engulfed by a malignancy or a dystrophic malignant calcification (1–3). Literature reviews have revealed that reported cases of calcified lung cancer are still uncommon (8).



**Figure 4.** Bronchoscopic lung biopsy, on histopathological examination, reveals malignant glandular structures with mucin secretion. Also, solid clusters of atypical cells mixed with scattered psammomatous-like calcification were seen and confirmed the diagnosis of mucinous moderately differentiated adenocarcinoma

Calcification within lung cancer occurs by the following mechanisms: (A) calcified scars or granuloma engulfed by a tumor, (B) dystrophic calcification in the necrotic parts of tumor, and (C) calcium deposition by the secretory function of carcinoma itself (e.g., mucinous adenocarcinoma) as in our case (1, 9). Histologically, Psammoma bodies are uncommon in lung adenocarcinoma. Interestingly, this predicts a good response to tyrosine kinase inhibitors (10).

## CONCLUSION

Lung calcification is not easy to interpret and may cause confusion. Detection of underlying disease should not be taken lightly. Although extensive lung calcification is rare in lung malignancy, it should be considered in the differential diagnosis.

**Informed Consent:** Written informed consent was obtained from patients who participated in this study.

**Peer-review:** Externally peer-reviewed.

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## REFERENCES

1. Siegelman SS, Khouri NF, Leo FP, et al: Solitary pulmonary nodules: CT assessment. *Radiology* 1986; 160: 313-317.
2. Grewal RG, Austin JH: CT demonstration of calcification in carcinoma

- of the lung. *J Comput Assist Tomogr* 1994; 18: 867-871
3. Matari H, Itani A, Amin H: Calcified small cell carcinoma of the lung. *J Thorac Imaging* 2003; 18: 104-105
  4. A.V. Palkar, A. Gupta, Y. Greenstein, E. Gottesman, Primary cardiac angiosarcoma: a rare cause of diffuse alveolar haemorrhage, *BMJ Case Rep.* 2018 (2018 Jun 4).
  5. K.M. Kerr, Pulmonary adenocarcinomas: classification and reporting, *Histopathology* 54 (2009) 12–27.
  6. M. Noguchi, A. Morikawa, M. Kawasaki, et al., Small adenocarcinoma of the lung. Histologic characteristics and prognosis, *Cancer* 75 (1995) 2844–2852.
  7. A. Gupta, S. Gulati, Mesalamine induced eosinophilic pneumonia, *Respir. Med. Case Rep.* 21 (2017 Apr 12) 116–117.
  8. Chao-Chun Lin, Jui-Sheng Hsu, Gin-Chung Liu et al: Small cell carcinoma of the lung with unusual calcification: a case report. *Chin J Radiol* 2005; 30: 125-128.
  9. Loudon SB, Winter WJ. Calcification within carcinoma of the lung: report of a case with isolated pulmonary nodule. *Arch Intern Med* 1954; 94:161-165.
  10. A. Miyake, K. Okudela, M. Matsumura, et al., Update on the potential significance of psammoma bodies in lung adenocarcinoma from a modern perspective, *Histopathology* 72 (4) (2018 Mar) 609–618.