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RESPIRATORY CASE REPORTS

# Pulmonary Actinomycosis: A Case Report

## Pulmoner Aktinomikoz: Olgu Sunumu

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### Abstract

Pulmonary actinomycosis is a bacterial disease caused by actinomyces species with nonspecific clinical and radiologic findings that make it difficult to diagnose, and that is mistaken for malignancy. We present here the case of 29-year-old woman who was admitted to our hospital with a cough that had been intermittently worsening for the last 3 years, and who was diagnosed with pulmonary actinomycosis based on transbronchial biopsy, despite the absence of bronchoscopic lesions.


**Keywords:** *Actinomycosis, endobronchial, bronchoscopy.*


### Öz

Pulmoner aktinomikozis, aktinomiçes türlerinin neden olduğu, nonspesifik klinik ve radyolojik bulguları olması nedeni ile doğru tanı konulmasında güçlük yaşanan, çoğunlukla malignite olarak değerlendirilen bakteriyel bir hastalıktır. Yirmi dokuz yaşında kadın hasta, son üç yıldır aralıklı olarak alevlenen öksürük şikâyeti ile başvurdu. Burada, bronkoskopik lezyon izlenmemesine rağmen transbronşial biyopsi incelemesinde pulmoner aktinomiçes tanısı alan olgumuz nadir görülmesi nedeniyle sunuldu.


**Anahtar Kelimeler:** *Aktinomikoz, endobronşiyal, bronkoskopi.*

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Actinomycosis is a chronic and rare infection associated with gram-positive, immobile anaerobic bacteria, usually involving the cervicofacial region, and more rarely the thorax, and abdominal, cerebral and laryngeal regions (1,2). It is a subacute or chronic infection that often mimics malignant lesions (2). Nodules, which may be confused with lung cancer on PA chest radiography, may present with consolidation or mass formation (3). Pulmonary actinomycosis accounts for 15% of all actinomycosis cases, and an accurate and timely diagnosis is made in only 4–7% of cases (4). We present here the case of a 29-year-old patient with pulmonary actinomycosis diagnosis who was treated for similar complaints 5 years earlier with a history of dental procedures.

## CASE

A 29-year-old woman was admitted to our clinic with a complaint of chronic cough, but no additional complaints such as chest pain, dyspnea or night sweats. The patient had undergone thyroidectomy for a toxic multinodular goiter and had been receiving levothyronine treatment. Here history included a monodermal teratoma that had been detected on the left ovary and surgically removed 1 year earlier, and admission to a medical center with cough and nausea 5 years ago when computed tomography of the right lower lobe superior segment revealed a bronchiectatic area. The patient had no smoking or alcohol history, and a history of dental prosthesis procedures. On physical examination, the patient was 158 cm, 49 kg, BMI 19.6, in good general condition, oriented and cooperative, while rales in the lower zones of the right lung were identified on respiration. Chest radiography and pulmonary computed tomography showed an area of increased density in soft tissues measuring 30.5 x 22 mm in the superior segment of the right lung lower lobe, and distal areas of trapped air (Figures 1 and 2). Bronchoscopy revealed no endobronchial lesions. The bronchial lavage was removed and a transbronchial biopsy was performed, and a pathologic examination of the transbronchial biopsy specimens revealed inflamed bronchial mucosa and cotton-like microorganism structures intertwined with bronchial epithelium. The samples were stained black for a methanamine sulfide histochemical study revealing branching hyphae structures (Figure 3). ARB was negative in the microbial examination. The patient was diagnosed with pulmonary actinomycosis, and was hospitalized and treated with intravenous sulbactam-ampicillin 4 x 1g. Partial regression of the infiltration in the right middle zone was observed in a control chest radiograph taken in the 3rd month of treatment (Figure 4). Her treatment is continuing.

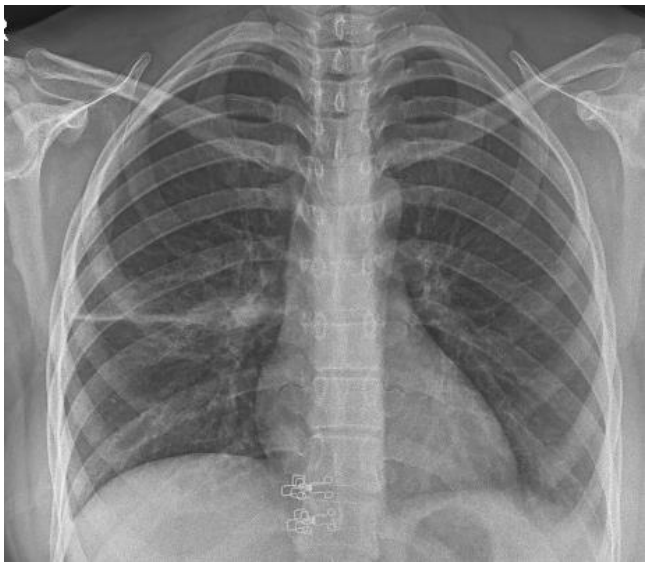

*Figure 1: Chest X-ray displaying consolation in the right-middle zone*

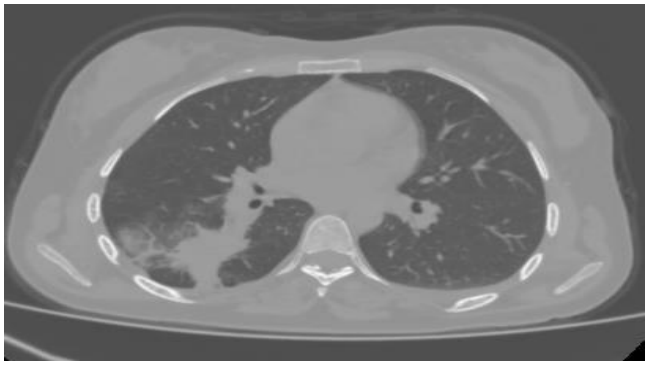

*Figure 2: Chest computed tomography showed an area of parenchymal consolidation in the superior segment of the upper right lower of the lung*

## DISCUSSION

Pulmonary actinomycosis continues to be diagnostically challenging for physicians due to the difficulties in differentiating from other diseases of the lung. Patients may present with nonspecific symptoms such as fever, cough, sputum, night sweats and weight loss (5). Immunosuppressive diseases such as chronic bronchitis, emphysema, poor oral hygiene, periodontal surgery, cervicofacial trauma and diabetes mellitus have been identified as predisposing factors for actinomycosis (6). Our patient presented with a chronic cough but no accompanying sputum, having presented with similar complaints 3 years earlier when she had received partial treatment. Her history included a periodontal intervention and poor oral hygiene, and an 18F-FDG PET/CT performed during the follow-up of an ovarian monodermal teratoma revealed FDG uptake in the left ovarian lobe and Dougles cavity and in the posterior segments of the upper lobe of the right lung. Bronchoscopy was planned to investigate the etiology of the chronic cough and pathologic uptake on imaging. Pathological examinations of biopsy specimens and the production of microorganisms in culture contribute diagnoses of actinomycosis (7). Bronchoscopy may

reveal exophytic masses characterized by purulent exudate and sulfur granules (5). In the presented case, the diagnosis was made with the demonstration of branching hyphae-like structures stained black with methenamine-silver belonging to actinomycosis on pathological examination of the biopsy specimen obtained after bronchoscopy. Beta-lactam antibiotics are among the preferred treatments, the duration of which can extend to 6–8 months (8). Patients with penicillin allergies may benefit from such alternatives as tetracycline, erythromycin and chloramphenicol (9). Surgery may be advised in the event of such complications as pulmonary abscesses and empyema, as well as the drainage of fistulas and sinuses (10). The patient in the present study was started on intravenous ampicillin-sulbactam 4x1gr iv treatment, which was switched to 2x1gr orally during follow-up. The patient's treatment is continuing.

## CONCLUSION

Pulmonary actinomycosis continues to be clinically challenging for physicians. Bronchoscopy is a key diagnostic tool in patients with prolonged symptoms that fail to resolve under empirical antibiotic therapy. We present this case to emphasize that pulmonary actinomycosis should be considered in the differential diagnosis of cases with late-responding or recurrent pneumonia.

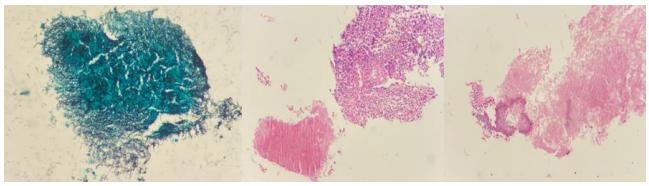

***Figure 3:*** *Branching hyphae-like actinomyces microorganism structures stained black for a methenamine-silver histochemical study (X400)*

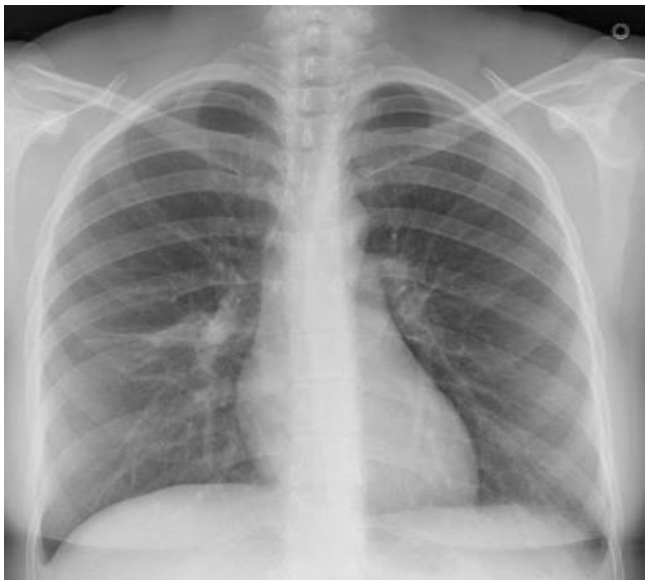

***Figure 4:*** *Partial regression of the infiltration in the right middle zone observed on chest radiograph taken at the 3rd month of treatment*

## CONFLICTS OF INTEREST

None declared.

## AUTHOR CONTRIBUTIONS

Concept - H.K., İ.G.Ç., S.N.A.D.; Planning and Design - H.K., İ.G.Ç., S.N.A.D.; Supervision - H.K., İ.G.Ç., S.N.A.D.; Funding -; Materials - H.K., İ.G.Ç., S.N.A.D.; Data Collection and/or Processing - H.K., İ.G.Ç., S.N.A.D.; Analysis and/or Interpretation - H.K., İ.G.Ç., S.N.A.D.; Literature Review - H.K., İ.G.Ç.; Writing - H.K., İ.G.Ç.; Critical Review - H.K., İ.G.Ç.

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