

## Incidentally Detected Pulmonary Actinomycosis Mimicking Lung Cancer: A Case Report

### Rastlantısal Olarak Saptanan Akciğer Kanserini Taklit Eden Bir Pulmoner Aktinomikoz Olgusu

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#### SUMMARY

*Actinomycosis is a chronic suppurative infection caused by Actinomyces, a branching filamentous gram-positive bacterium that can involve many organs. When the lungs are involved, it is called pulmonary actinomycosis, which may rarely mimic lung cancer radiologically. The differential diagnosis is very difficult by the routine investigation methods and usually requires tissue biopsy. Here, we report a case of pulmonary actinomycosis mimicking lung cancer, which was diagnosed and treated with surgical excision.*

**Key Words:** Pulmonary actinomycosis, Lung cancer, Histopathology

#### ÖZET

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*Aktinomikoz Actinomyces'in neden olduğu kronik süpüratif bir enfeksiyondür. Actinomyces ise birçok organı etkileyebilen dallanan iplik-si gram-pozitif bir bakteridir. Akciğer tutulumuna pulmoner aktinomikoz denir ve radyolojik olarak nadiren akciğer kanserini taklit edebilir. Rutin değerlendirmelerle tanı koymak zordur genellikle doku biyopsisi gereklidir. Burada akciğer kanserini taklit eden bir pulmoner aktinomikoz olgusu sunulmaktadır.*

**Anahtar Kelimeler:** Pulmoner aktinomikoz, Akciğer kanseri, Histopatoloji

## INTRODUCTION

*Actinomyces* spp. is a gram-positive, filamentous, anaerobic, slow-growing bacterium. Actinomycosis may involve various sites, including cervicofacial (55%), abdominal-pelvic (20%) and thoracic (15%) organs, in which the skin, brain, pericardium, and limbs are less frequently involved<sup>[1]</sup>. Pulmonary actinomycosis is a rare and chronic disease. It may mimic a number of other conditions, particularly malignancy, tuberculosis, lung abscess, and granulomatous disease<sup>[2]</sup>. The clinical and radiological findings are nonspecific. Histopathological and microbiological investigations of the involved tissue are crucial for the definite diagnosis. Here, we report a case of pulmonary actinomycosis mimicking lung cancer.

## CASE REPORT

A 50-year-old male, a chronic smoker with a smoking index of 30 pack/years, was referred to the outpatient clinic of the Infectious Diseases Department for further evaluation. He had a history of lung lobectomy due to suspicion of lung cancer. No pathological physical findings were detected on admission, other than poor oral hygiene. His history revealed that he had been admitted to the Chest Department for a check-up although there was no physical complaint. Despite normal physical examination findings, a routine chest radiograph had been taken. On the plain chest radiography, irregular localized pneumonic consolidation was seen in the middle zone of the right lung. In addition, routine laboratory investigations were within normal ranges except for detection of a mass lesion in the upper lobe of the right lung in computed tomography (CT) (Figure 1). Several short courses of antimicrobials such as amoxicillin-clavulanate, ceftriaxone and moxifloxacin had been given over three months with a presumptive diagnosis of pneumonia, based on these radiologic findings. Because of unimproved findings and progression of infiltrations in the chest radiography, a follow-up CT scan of the chest was obtained, which confirmed the expansion of the consolidated area in the right lung (Figure 2). Primarily, malignancy and tuberculosis were considered in the differential diagnoses, and positron emission tomography (PET)-CT scan was performed. Focally linear F-18 fluorodeoxyglucose (FDG) uptake

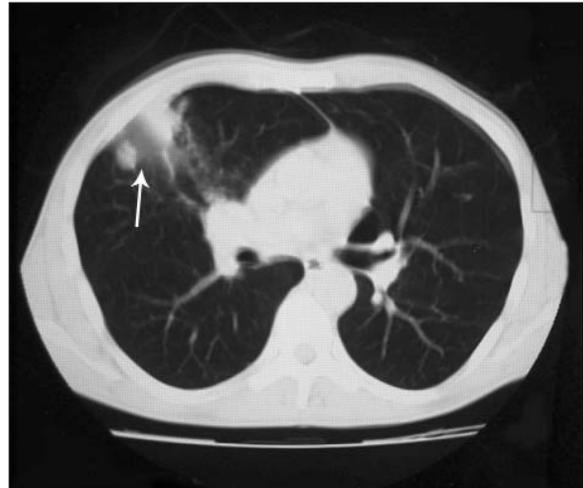


Figure 1. CT image showing a mass lesion in the upper lobe of the right lung.

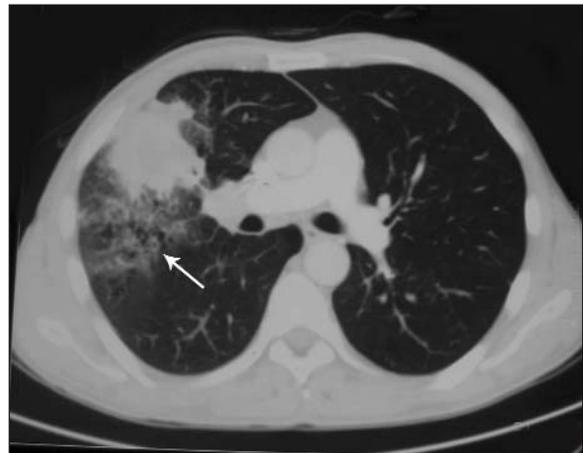


Figure 2. The follow-up CT scan showing the expansion of the consolidated area in the right lung.

(SUV max: 6.4) was detected in the middle right lung, which was consistent with malignant involvement. Because of the probable diagnosis of lung cancer, lobectomy of the middle zone of the right lung measuring 13 x 14 x 6 cm was performed. Histopathology showed chronic active inflammation and branching filamentous gram-positive bacteria on gram staining, compatible with actinomycosis (Figure 3).

Actinomycosis was diagnosed according to histopathology, and oral amoxicillin (2 g/daily) treatment regimen was initiated, and continued for 30 days. No complications occurred during the follow-up visits.

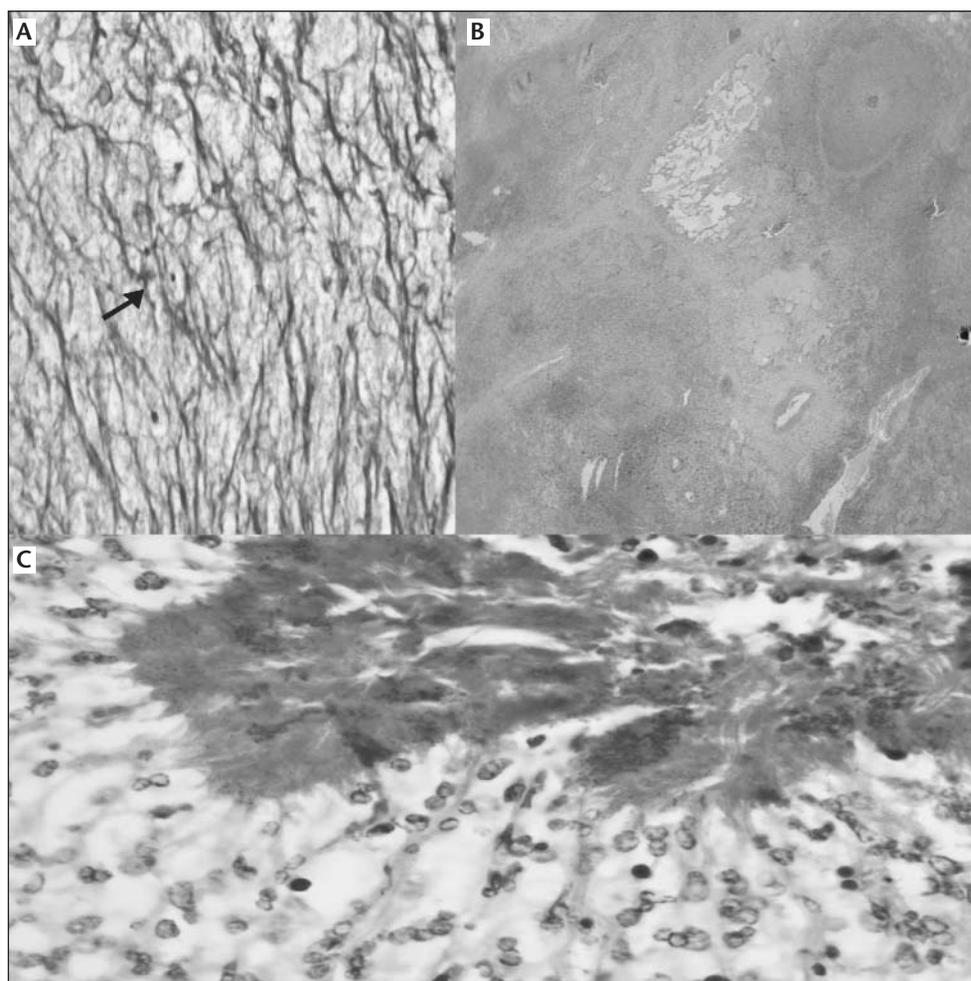


Figure 3. The biopsy showed multiple branching filamentous gram-positive rods (A), a necrotizing granulomatous pneumonitis (B), and multifocal microabscesses (C).

## DISCUSSION

Actinomycosis is a chronic suppurative infection caused by *Actinomyces*, a branching filamentous gram-positive bacterium that can colonize various sites, particularly the oropharynx, gastrointestinal tract and female genitalia. Pulmonary actinomycosis is one form, the rate of which is reported to be 15%<sup>[3]</sup>. Pulmonary actinomycosis generally occurs from aspirations of oropharyngeal secretions<sup>[4]</sup>. Hematogenous spread is very uncommon. The risk factors for development of pulmonary actinomycosis are poor oral hygiene, oral trauma, and dental procedures. Microaspiration of colonized oral flora is a probable cause of the pulmonary infection in our case.

The main symptoms of pulmonary actinomycosis are nonspecific, including cough, sputum and chest pain, and resemble those of other chronic chest diseases and malignancies, such as weight loss, malaise, high fever, dyspnea, and hemoptysis<sup>[3]</sup>. In the laboratory tests, the erythrocyte sedimentation rate and C-reactive protein may rise moderately, similar to the other chronic diseases, and usually a mild leukocytosis, predominantly polymorphonuclear cells, can be seen<sup>[3]</sup>. In contrast, in our case, all physical and laboratory findings were in normal ranges. In chronic forms of the disease, many complications can be seen over time, such as sinuses and fistulas, localized chest wall swelling, empyema, and osteoarthropathy.

No complication was noted during the entire course of the disease in our case.

Radiological findings are nonspecific, but can be helpful for guiding the biopsy and for monitoring treatment response<sup>[3]</sup>. The progression of lesions despite the antimicrobial treatment and positive F-18 fluorodeoxyglucose involvement should primarily be considered as malignancy<sup>[5]</sup>. Definite diagnosis is based on histopathology and microbiological confirmation. *Actinomyces* is a fastidious bacterium that is difficult to culture; thus, only 50% of cultures might be positive in ideal growth conditions<sup>[6]</sup>. Most of the antibiotics used in daily practice are effective on *actinomyces*. Culture of the lobectomy specimen remained negative in our case probably due to the inhibitory effect of the previous antibiotic usage<sup>[7]</sup>. The progression of pulmonary lesions under antimicrobial treatment might be related with the inadequate durations of the antimicrobial courses.

The most common indication for thoracotomy is the suspicion of cancer<sup>[8]</sup>. Because of the imaging findings mimicking cancer, our case underwent surgical intervention, and the diagnosis was confirmed with demonstration of sulfur granules histopathologically. The treatment choices include antibacterial therapy alone or surgical intervention combined with antibiotherapy, and the duration of antibiotic treatment varies according to the selected regimen<sup>[8]</sup>. The antibiotic treatment in thoracic actinomycosis was reported to be shorter than three months after surgery when the main lesion was removed<sup>[8]</sup>. In this case, we considered the use of antibiotic for a month after surgical intervention in light of the literature findings.

In conclusion, pulmonary actinomycosis usually lacks the typical symptoms and signs. Therefore, it

should be considered in patients with poor oral hygiene presenting with chronic pneumonia. It can mimic lung cancer on imaging. Diagnosis is usually confirmed by histopathological examinations.

## REFERENCES

1. Brown JR. Human actinomycosis. *Hum Pathol* 1973;4:319-30.
2. Alves dos Santos JW, Torres A, Michel GT, de Figueiredo CW, Mileto JN, Foletto VG Jr, et al. Non-infectious and unusual infectious mimics of community-acquired pneumonia. *Respir Med* 2004;98:488-94.
3. Mabeza GF, Macfarlane J. Pulmonary actinomycosis. *Eur Respir J* 2003;21:545-51.
4. Bennhoff DF. Actinomycosis: diagnostic and therapeutic considerations and a review of 32 cases. *Laryngoscope* 1984;94:1198-217.
5. Madhusudhan KS, Gamanagatti S, Seith A, Hari S. Pulmonary infections mimicking cancer: report of four cases. *Singapore Med J* 2007;48:327-31.
6. Burden P. Actinomycosis. *J Infect* 1989;19:95-9.
7. Tanaka-Bandoh K, Watanabe K, Kato N, Ueno K. Susceptibilities of *Actinomyces* species and *Propionibacterium propionicus* to antimicrobial agents. *Clin Infect Dis* 1997;25:262-3.
8. Choi J, Koh WJ, Kim TS, Lee KS, Han J, Kim H, et al. Optimal duration of IV and oral antibiotics in the treatment of thoracic actinomycosis. *Chest* 2005;128:2211-7.

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