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**OLGU SUNUMU / CASE REPORT**

# Pulmonary infection caused by Mycobacterium szulgai

## Mycobacterium szulgai'nin neden olduğu pulmoner enfeksiyon

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**Abstract**

Pulmonary infections are the most common manifestations of non-tuberculosis mycobacteria infections. We report a 54-year-old male patient complaining about cough, hemorrhagic sputum, weakness and weight loss with a history of treated pulmonary tuberculosis. Radiological findings and early-morning gastric fluid mycobacteriological culture indicated fibrocavitary pulmonary infection caused by M. szulgai. The patient was successfully treated with standard 6-month antituberculosis therapy regimen with re-evaluation bimonthly for 12 months. Physicians should consider non-tuberculosis mycobacteria infections for especially individuals with risk factors if it is clinically compatible and supports microbiological findings. When isolated, M. szulgai must be considered as a causative pathogen.

**Key words:** Non-tuberculosis mycobacteria, slowly-growing mycobacteria, pulmonary infection.

**Öz**

Pulmoner enfeksiyonlar, tüberküloz dışı mikobakterilerin neden olduğu enfeksiyonların en sık görülen formlarıdır. Öksürük, kanlı balgam, halsizlik ve kilo kaybı şikayetleri olan ve amamnezinde tedavi edilmiş pulmoner tüberküloz hikayesi bulunan 54 yaşında erkek hasta vakasını bildiriyoruz. Radyolojik bulgular ve sabah alınan açlık mide suyunun mikobakteriyolojik kültürü, M.szulgai'nin neden olduğu fibrokaviter akciğer enfeksiyonuna işaret etmiştir. Hasta, 12 ay boyunca her 2 ayda bir yeniden değerlendirilmek üzere standart 6 aylık antitüberküloz tedavi rejimi ile başarıyla tedavi edilmiştir. Klinisyenler, özellikle risk faktörlerini taşıyan bireylerde, klinik uyumluluğun olması ve mikrobiyolojik bulguların da desteklemesi durumunda, tüberküloz dışı mikobakterilerin neden olduğu enfeksiyonları düşünmelidirler. M.szulgai, izole edildiği zaman, enfeksiyon etkeni patojen olarak değerlendirilmelidir.

**Anahtar kelimeler**: Tuberküloz dışı mikobakteriler, yavaş üreyen mikobakteriler, akciğer enfeksiyonu.

## INTRODUCTION

Non-tuberculosis mycobacteria (NTM) are inhabitant environmental microorganisms causing various infections. NTM were used to be interpreted as contaminants, but currently, this opinion has widely changed. Recently, due to increased awareness and isolation capability of NTM, many case reports were published worldwide[1].

Many sources may be the reason of exposure to NTM, such as water supply systems, baths, soil and dust, but the major routes of transmission have not been obviously demonstrated yet[1,2]. Geographic location, climate, population density and host factors seem to be mostly decisive on species distribution and form of infectious diseases[1-3]. Pulmonary infections (PI) are the most frequent form of manifestations. Isolation from pulmonary specimens does not always indicate infection and The American Thoracic Society and Infectious Disease Society of America (ATS/IDSA) published major guidelines to identify real infection[2,4-6]. PI are often related with underlying conditions such as history of pulmonary tuberculosis (PTB), obstructive lung disease, bronchiectasis[6,7].

Among NTM, slowly growing mycobacteria (SGM) are more often isolated from pulmonary samples[3]. Susceptibility to antibiotics varies by species level

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and thus, certain identification is crucial to choose appropriate antibiotic therapy regimen[7]. Although M. szulgai is rarely isolated, its isolation usually indicates infection, especially with clinical concordance[4,7]. ATS/IDSA recommends particular therapies for PI caused by NTM, but for M. szulgai, there is still an uncertainty due to lack of published data[6,7].

## CASE

We reported a 54-year-old male patient with cough, hemorrhagic sputum, weakness and weight loss, admitted to our pulmonary medicine service with a history of treated PTB 20 years ago. Following theexamination, the patient was scheduled for chest X-ray, Thorax CT, routine blood tests and mycobacteriological analysis. Sputum sample was not enough qualified and early-morning gastric fluid examination was applied.

Chest X-ray was significant for cavitary lesions and infiltrations in the right lung (Figure 1). A large cystic lesion in the right upper posterior segment, surrounded with multiple soft tissue density, heterogeneous infiltrates, fibrotic and atelectatic areas, was observed in Thorax CT (Figure 2). Gastric fluid examination by acid-fast staining (AFS) was evaluated as (++) for acid-fast bacilli. PCR and GenoType MDRsl reverse hybridization method (Hain Lifescience GmbH, Nehren, Germany) resulted as M. szulgai. Growth on culture with Löwenstein-Jensen (LJ) media (Salubris, Istanbul, Turkey) and in BACTEC MGIT 960 (Becton Dickinson, Sparks, MD, USA) liquid culture medium was observed. For NTM confirmation, selective inhibition of M. tuberculosis complex by para-nitro benzoic asid and BD MGIT TBc Identification immunochromatographic assay (Becton Dickinson, Sparks, MD, USA) was performed. Routine drug susceptibility testing was not applied due to lack of published data[6-8].

According to the ATS/IDSA guideline, the patient was diagnosed as M. szulgai pulmonary infection. A combination therapy of isoniazid, rifampin, ethambutol, pyrazinamide for 6 months was started[6]. For 12 months, in every 2 months-time, the patient was re-evaluated and specimens were taken for further AFS and cultures. After 6 months of anti-tuberculosis therapy, a sample of bronchoalveolar lavage was cultured, AFS was negative and no growth was observed. In the 12$^{th}$ month after diagnosis, control cultures were retaken and all resulted as negative. The patient was consequently accepted as cure.

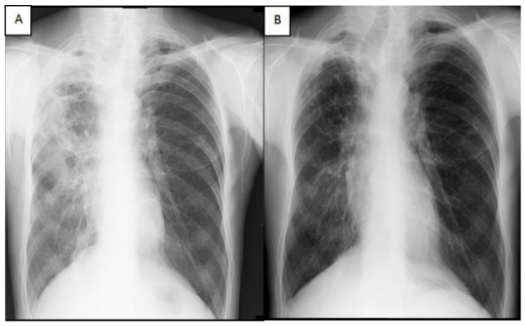


**Figure 1. PA Chest X-ray a) before treatment, b) after treatment**

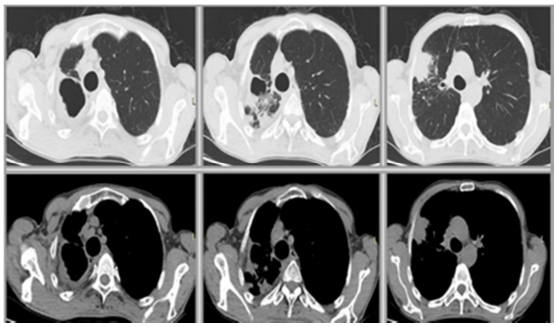

**Figure 2: Thorax CT slices of first admission**

## DISCUSSION

NTM are environmental inhabitant microorganisms and although there is no obviously demonstrated cycle of infection to humans, it is clear that both natural and human-made environments are the sources[1]. PI are the most common manifestations and TNF-inhibitor treatment, history of PTB, obstructive lung disease, bronchiectasis, lung transplantation and cystic fibrosis are the major risk factors[2,4,8]. Three forms of PI were identified (fibrocavitary disease, nodular bronchiectasis and hypersensitivity pneumonitis)[4]. AST/IDSA published a guideline on decision whether NTM is the real pathogen agent of PI, or not. In our case, the patient had the risk factors of age (50+) and a history of PTB. The symptoms of M. szulgai PI are similar to PTB as symptoms in our case[6]. Cavitary

lesions, which are relatively more common forms of infection in M. szulgai pulmonary disease, were observed in the upper zone of right lung surrounded by fibrotic tissue in X-ray and Thorax CT[7].

In pulmonary samples, SGM seems to be predominantly isolated in Turkey, but the clinical significance still remains unclear[3,5]. M. szulgai has been very rarely isolated worldwide, and only a few cases were reported from Turkey[2,4-6,9,10]. Despite of other NTMs, M. szulgai must be considered as a pathogen when it is isolated[4,6]. Conventional culture techniques, automated liquid culture or molecular methods will be sufficient to isolate and identify this species. On the other hand, some reviewers suggest modifications on decontamination procedures[4]. In our case, two separate repeated early-morning gastric fluid samples were evaluated and M. szulgai was isolated and identified from both samples.

Antimicrobial susceptibilities of NTM show a wide variation depending on species level[8]. ATS/IDSA does not recommend a particular therapy for M. szulgai and it is still indistinct of a certain antimicrobial therapy due to lack of published data and antimicrobial susceptibility tests have not been standardized yet. For M. szulgai PI, current recommendation is long-term antimicrobial therapy and evaluation of the patient for 12 months by culture[6,7]. M. szulgai is usually in vitro susceptible to most of the anti-tuberculosis drugs, but resistance to some antimicrobials were reported[6]. Cases, treated successfully with a standard 6-month anti-tuberculosis therapy, were also reported, and physicians may consider a combination therapy with anti-tuberculosis drugs and macrolides[6,7]. In our case, the patient was treated with a standard 6-month anti-tuberculosis regimen, and after 12 months of repeated-culture observation, the patient was discharged with cure.

In conclusion, NTM infections have become emerging diseases[1]. Identification to the species level is necessary due to both variable antimicrobial resistance patterns and clinical and radiologic similarity with PTB[6,8]. Standard mycobacteriological procedures are often sufficient to isolate and identify M. szulgai, but in case of suspicious infections, cooperation between clinicians and laboratories is crucial due to reported modifications on culture techniques[4]. Additionally, treatment with 6-month anti-tuberculosis therapy seems to be sufficient and early-morning gastric fluid seems to be an alternative method of collection in M. szulgai PI.

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