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Pulmonary *Mycobacterium kansasii* Disease in Previously Healthy Women

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Abstract

We encountered two cases of pulmonary *M. kansasii* disease in two women without underlying diseases in our hospital. Case 1 was a 52-year-old woman who visited with an abnormal chest shadow. She showed nodular and linear shadows with bronchiectatic changes and small cavities in the left upper lobe and lingula, and was diagnosed with pulmonary *M. kansasii* disease because *M. kansasii* was isolated from her bronchoscopic specimens. Case 2 was a 33-year-old woman who visited with a productive cough. She showed several cavity lesions in the right lung, and was diagnosed with pulmonary *M. kansasii* disease from several isolated sputum samples. Combination therapy using INH, RFP, and EB was effective treatment for the two cases. Because pulmonary *M. kansasii* disease in previously healthy women shows various radiological patterns, it was considered important to perform acid-fast bacilli examination using clinical specimens in order to decide on the appropriate treatment methods.

Keywords

Pulmonary *M. kansasii* Disease, Women

1. Introduction

The frequency of pulmonary nontuberculous mycobacterial (NTM) disease has been increasing recently. As the causative microorganisms of pulmonary NTM disease, *Mycobacterium avium* and *Mycobacterium intracellulare* are the most frequently isolated in Japan (80%) [1], and the nodular bronchiectatic type of pulmonary MAC disease has been reported to show the high percentage in women without underlying diseases (54% - 92%) [2] [3]. On the other hand, *Mycobacterium kansasii* was the third most frequently isolated, and pulmonary *M. kansasii* disease has been reported with most patients being male with underlying respiratory diseases such as chronic obstructive pul-

monary disease (COPD). Also, radiological findings are similar to those of pulmonary tuberculosis with a thin-walled cavity [4]. Because there are few reports on the clinical characteristics of pulmonary *M. kansasii* disease in previously healthy women [5] [6], we investigated the clinical characteristics of the two cases in our hospital.

2. Case

Case 1: A53-year-old woman visited our hospital due to an abnormal chest shadow. She had no underlying diseases and no smoking history. There were no abnormal physical findings on admission. There were no abnormal laboratory findings in the peripheral blood or chemical screening, but Quanti FERON TB-Gold (QFT-G) was also positive (ESAT-6: 0.92 IU/ml). Chest radiographs showed nodular and linear shadows in the left upper lung field (**Figure 1**). Chest CT showed nodular and linear shadows with bronchiectasis and small cavities in the left upper lobe and lingula (**Figure 2**). Because she could not expectorate sputum and we could not rule out pulmonary tuberculosis completely, we performed bronchoscopy. The culture of bronchoscopic specimens generated acid-fast bacilli and the result of DNA-DNA hybridization (DDH) method identified *M. kansasii*. Finally, she was diagnosed with pulmonary *M. kansasii* disease. Afterwards, she was treated with combined chemotherapy using INH, RFP, and EB for one year and abnormal chest shadows improved following the combined chemotherapy.

Case 2: A 33-year-old woman visited our hospital complaining of productive cough and general fatigue. She had no underlying diseases and no smoking history. There were no abnormal physical findings on admission. There were no abnormal laboratory findings except for the elevation of C-reactive protein (CRP 0.34 mg/dl, normal range: <0.30 mg/dl). Although TST was not performed, QFT-G was negative (<0.05 IU/ml). Chest radiographs showed linear shadows in the right upper lung field and cavity lesions in the right upper and lower lung fields (**Figure 3**). Chest CT showed several cavities surrounding the infiltration shadow and satellite lesions with bronchiectasis in the right upper and lower lobes (**Figure 4**). The culture of expectorated sputum generated

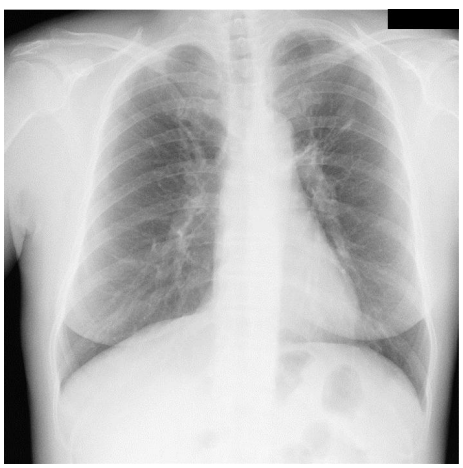

Figure 1. Chest radiograph s showed nodular and linear shadows in the left upper field.

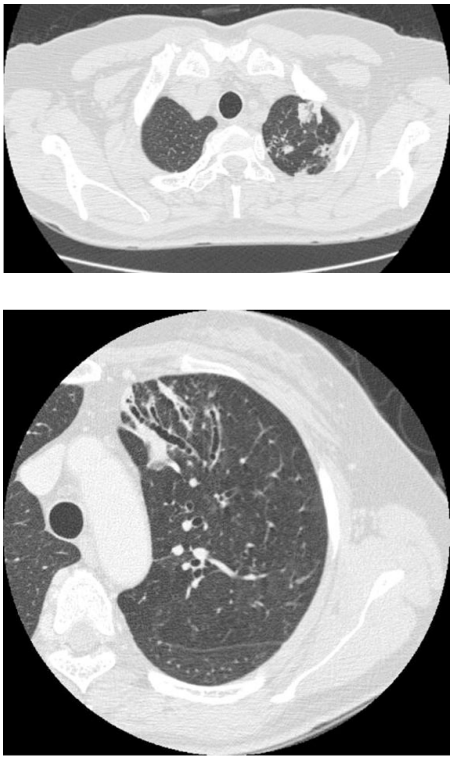

Figure 2. Chest CT showed nodular and linear shadows with bronchiectasis and small cavities in the left upper lobe and lingula.

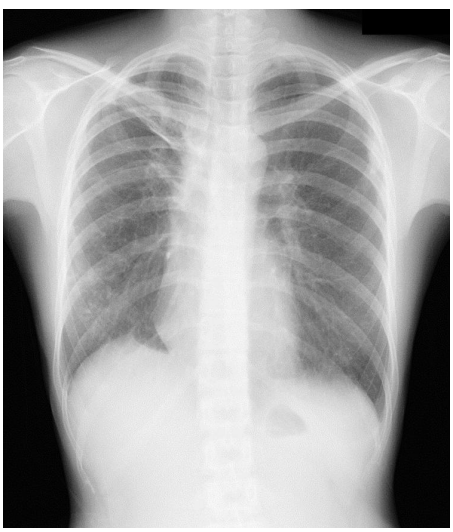

Figure 3. Chest radiographs showed linear shadows in the right upper filed and cavity lesions in the right upper and lower lung fields.

acid-fast bacilli several times and the result of DDH method identified *M. kansasii*. Finally, she was diagnosed with pulmonary *M. kansasii* disease based on the diagnostic criteria of the ATS guidelines [7]. She was treated with combined chemotherapy using

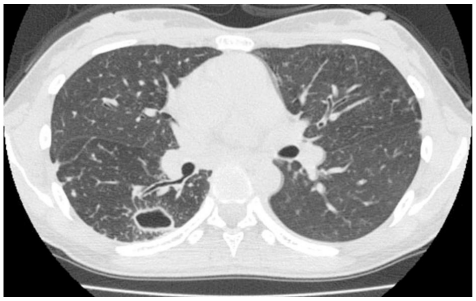

Figure 4. Chest CT showed several cavities surrounding the infiltration shadow and satellite lesions with bronchiectasis in the right upper and lower lobes.

INH, RFP, and EB for one year and clinical symptoms and abnormal chest shadows improved following the combined chemotherapy.

3. Discussion

The frequency of *M. kansasii* among the causative microorganisms of pulmonary NTM disease has been reported as 8.1% in Japan, and it has increased in Japan and the United States of America [8] [9].

The frequency in males was reported to be the high about the sex classification of pulmonary *M. kansasii* disease [10]. The clinical characteristics of male patients with pulmonary *M. kansasii* disease were middle-aged smokers with underlying respiratory diseases, showing cavity lesions as radiological findings [8] [11].

Regarding CT findings of pulmonary *M. kansasii* disease, they can be summarized as follows: 1) the distribution of lesions was most frequent in the upper lobe and bilateral lung field; 2) the extent of lesions was limited within the unilateral lung field; 3) infiltration shadows or small centrilobular nodules with bronchiectasis were recognized in over half of all patients, and 4) typical radiological findings such as cavities (thin-walled cavities) were recognized in over half of all patients [12] [13] [14]. The propensity of pulmonary lesions to affect the upper lobe in pulmonary *M. kansasii* disease was similar to that of *Mycobacterium tuberculosis* (MTB) [15]. High oxygen tension in the ape helps *M. kansasii* to be preferentially localized [16]. The incidence of cavity formation has been considered high in patients with pulmonary *M. kansasii* diseases well as in previous reports from Japan [4]. However, more recent studies reported incidence rates from 32% to 54% [12] [13] [14]. This discrepancy in the incidence cavity formation may be explained by recent improvements in the diagnostic methods used (bronchoscopy, etc.) and microbiological isolation of the organism [17].

There were two reports described about female patients with pulmonary *M. kansasii* disease in Japan as far as we investigated. Kamiya *et al*. [5] reported that eight female patients with pulmonary *M. kansasii* disease were middle-aged non-smokers without underlying respiratory diseases, presenting with nodular bronchiectatic lesions as radiological findings. On the other hand, Ohnishi *et al*. [6] reported that three female patients with pulmonary *M. kansasii* disease were younger non-smokers without under-

lying diseases, presenting with cavity lesions in the upper lobes, similar to pulmonary tuberculosis in previous studies of female patients with pulmonary *M. kansasii* disease. These two reports described the different radiological findings. In our two female patients with pulmonary *M. kansasii* disease, case 1 showed a mixed type comprising both nodular bronchiectatic lesions and small cavity lesions, and case 2 showed cavity lesions surrounding infiltration shadow and nodular lesions with bronchiectasis. Although there are not so many female patients with pulmonary *M. kansasii* disease in Japan, it is thought that pulmonary *M. kansasii* disease in female patients presents with various radiological findings, such as the fibrocavitary or nodular bronchiectatic type.

Because the regimen of combined chemotherapy and clinical effect were different according to the causative microorganism, it is important to identify the causative microorganism of pulmonary NTM disease by positive diagnostic methods such as bronchoscopy. Regarding treatment for pulmonary *M. kansasii* disease, combined chemotherapy using INH, RFP, and EB for at least one year as recommended by the ATS shows a favorable clinical effect [7]. Our two female patients with pulmonary *M. kansasii* disease also showed good clinical responses with this treatment method for one year.

4. Conclusion

When we encounter female patients who are suspected of having pulmonary NTM disease, we need to positively collect clinical specimens and identify microorganisms correctly by DDH methods.

Conflict of Interest

There are no conflicts of interest regarding this manuscript.

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