The term “Lady Windermere’s syndrome” was first used in 1992 to describe a symptom complex in elderly women without preexisting lung disease, who developed Mycobacterium avium complex (MAC) pulmonary infection limited to the middle lobe or lingula[1-2]. The middle lobe and lingula have long, narrow, dependent bronchi and an absence of collateral ventilation that predisposes them to inflammation. Since women are more likely to regard expectoration as socially unacceptable behavior, they may suppress coughing. This voluntary cough suppression leads to an inability to clear secretions, which results in a chronic nidus for inflammation that favors subsequent infection by MAC.

The radiological presentation of Lady Windermere’s syndrome that is often associated with bronchiectasis is becoming increasingly seen in elderly women who have no underlying lung disease and no smoking history. These patients may be in a relatively stable clinical condition, except for chronic cough with or without sputum production. However, if the correct diagnosis is delayed or missed, progressive dyspnea and a deteriorated pulmonary function may then develop. The prognosis is related to the early recognition of the disease, the radiographic extent of the disease, and its long-term treatment with several drugs.

We report 2 cases that appear to comprise a distinct clinical syndrome, the cardinal features of which are (1) the initial involvement of the periphery of the lingula or of its counterpart, the middle lobe; (2) the absence of underlying lung disease or smoking history; (3) the exclusivity of the features to elderly female patients; and (4) 3 consecutive positive sputum cultures for MAC. Based on the features described above, these 2 cases met the criteria of Lady Windermere’s syndrome. Since the sputum mycobacterium culture had not been checked until the clinical symptoms had exacerbated, the diagnosis of our 2 patients was delayed for 6 months and 1 year, respectively. Therefore, Lady Windermere’s syndrome should be considered in women who suffer from chronic cough, and have a lesion on the right middle lobe or left lingular lobe. Mycobacterium cultures should be evaluated immediately to differentiate Lady Windermere’s syndrome from pure bronchiectasis. *(Thorac Med 2005; 20: 484-489)*

Key words: right middle lobe bronchiectasis, left lingular lobe bronchiectasis, pulmonary MAC infection, Lady Windermere’s syndrome
Introduction

Respiratory infection with *Mycobacterium avium complex* (MAC) in patients without acquired immune deficiency syndrome is now understood to have a major expression. The classic radiological pattern is upper lobe cavitary disease in male tobacco smokers who have chronic obstructive lung disease. This radiographic pattern mimics tuberculosis. Another smaller group of patients has no apparent underlying lung disease and a negative smoking history. This group comprises women primarily. The radiographic appearance consists of a small nodular or interstitial disease that is often associated with bronchiectasis. Interestingly, the disease is commonly confined to the lingular and/or middle lobe, and has been named “Lady Windermere’s syndrome”.

When reviewing the 120 clinical isolates of the MAC infection cases in our hospital from the most recent 3 years, we found that 13 patients fulfilled the American Thoracic Society criteria for MAC pulmonary disease. Nine of them were males, and 4 were females. It was interesting to find that the 4 elderly women patients confirmed with MAC pulmonary infection all showed infiltrates in the right middle or lingular lobe, an atypical radiographic appearance of pulmonary MAC infection. After reviewing the literature, we found that these cases met the criteria of Lady Windermere’s syndrome. Herein, we present 2 of the 4 patients.

Case Reports

Case 1

A 62-year-old woman visited our OPD because of chronic productive cough and exertional dyspnea that had begun insidiously several years earlier. The patient had no history of smoking, and had had no noxious environmental exposure. She also denied exposure to tuberculosis. The personal and family history was nega-
tive for pulmonary disease.

The patient was thin. Her vital signs were stable. There was no pectus excavatum or scoliosis. The breathing sounds were clear, and her heart sounds were normal. The remainder of her physical examination also showed negative findings.

The patient’s white blood cell count and differential count were normal, and her biochemical profile was unremarkable. The chest roentgenogram disclosed infiltration in the right middle lobe and left lingular region. She underwent conservative treatment and was followed up at our OPD. No further survey was carried out.

Unfortunately, the pulmonary infiltrates had progressed and the exertional dyspnea exacerbated when she visited our OPD again 6 months later. Pulmonary tuberculosis was highly suspected, so a sputum tuberculosis culture and chest CT scan were performed. The CT scan confirmed the infiltration to be bronchiectasis. In addition, 3 consecutive sputum cultures all showed positive for MAC infection. She then began to receive medical treatment with rifampicin, EMB, and clarithromycin. After treatment for 1 year, the symptoms subsided.

**Case 2**

A 67-year-old women had suffered from cough with whitish sputum off and on for about 1 year. She then visited the family medicine OPD. She had never smoked tobacco, and had no history of noxious environmental exposure. She denied a history of tuberculosis exposure, as well. Her vital signs and physical examination were normal.

Laboratory data were unremarkable, but lingular infiltrates were apparent on the chest roentgenogram. Because of her stable condition, the infiltrates in the lingula were thought to be chronic inflammatory change, so she received symptomatic treatment and was followed up at the family medicine OPD. However, the patient’s symptoms exacerbated 1 year later, and she was referred to the chest medicine OPD. Based on

![Fig. 2a. Chest X-ray of case 2, showing infiltrates in the left lingual.](image-url)

![Fig. 2b. Chest CT scan of case 2, confirming the infiltrates in the left lingula to be bronchiectasis.](image-url)
the course of the disease, pulmonary tuberculosis was highly suspected. Sputum tuberculous cultures were performed, and the reports showed positive for MAC in 3 samples that were collected at different times. In addition, the chest CT scan disclosed bronchiectasis in the left lingular segment. The patient then became lost to follow up and did not receive any further treatment.

Discussion

The signature case of Lady Windermere’s syndrome is an elderly woman without pre-existing lung disease, and with radiographic evidence of lingular and/or right middle lobe infiltrates thought to be secondary to infection with an opportunistic pathogen, particularly MAC [1]. Reich and Johnson first used the term “Lady Windermere’s syndrome” in 1992. They described 6 elderly women with no significant smoking history or underlying pulmonary disease, who developed MAC pulmonary infection limited to the right middle lobe or lingula [2].

The middle lobe and lingula have in common long, narrow, (in an upright position) dependent bronchi, and an absence of collateral ventilation that predisposes them to infection, particularly bronchiectasis [3]. It seems reasonable to infer that these regions of the lung clear secretions less efficiently than their counterparts elsewhere, and also that they may require greater tussive effort to do so. In addition, the traditional apothegm, “Lady, do not spit” embodies the idea that women are more fastidious and more likely to regard expectoration as socially unacceptable behavior, and thus indulge in habitual voluntary cough suppression. Continual cough suppression is hypothesized as placing women at greater risk of developing inflammatory processes in the lingula and the middle lobe. Recalling the fastidious nature of the central character in Oscar Wilde’s play “Lady Windermere’s Fan,” the symptom complex was dubbed “Lady Windermere’s syndrome” [1].

Most of the patients with non-obstructive middle lobe syndrome due to MAC seem to be thin, elderly women with a high prevalence of abnormalities of the chest wall and thoracic spine, Iseman et al [4] and Pomerantz et al [5] described most of their patients as thin women for whom the incidence of skeletal abnormalities (including pectus excavatum, mild scoliosis, straight back, and mitral valve prolapse) was very high. They also believed that the thoracic skeletal abnormalities could result in decreased sputum clearance and an ineffective cough mechanism, which could also contribute to the progression of the disease. The classic radiographic appearance of pulmonary MAC is indistinguishable from that of pulmonary tuberculosis. This classic form is seen most commonly in males and is typically associated with other predisposing diseases, especially chronic obstructive pulmonary disease. Most patients have upper lobe diseases with a mixture of linear opacities and small nodules. The second, the so-called nodular bronchiectatic form, occurs predominantly in nonsmoking middle-aged or elderly women who also present with chronic cough and sputum production [6]. Our patients presented with lingular lobe bronchiectasis, an atypical presentation of pulmonary MAC infection. Historically, the medical treatment for MAC infectious disease in HIV-negative patients has been disappointing. Before the introduction of macrolides in the 1990s, multi-drug regimens, including isoniazid, rifampicin, ethambutol, and streptomycin had been recommended. The long-term success rate was less than 50%, mainly due to treatment failure and relapse [7]. The newer macrolides, clarithromycin and azithromycin, have shown excellent in vitro and clinical results...
in recent studies. For the treatment of adults without HIV infection, the American Thoracic Society recommends a regimen of clarithromycin or azithromycin, rifampin or rifabutin, and ethambutol, to be taken daily. Streptomycin should also be considered, especially for patients who have radiographically extensive or cavitary disease, and particularly when this is accompanied by strongly positive sputum smears [8]. Reports have mentioned sputum conversion rates of up to 90% in patients with no history of previous treatment failure and toleration of all 3 oral drugs. Treatment is continued until sputum cultures are consecutively negative or the symptoms have subsided for at least 1 year.

Of the 2 patients reported herein, 1 visited the chest physician initially, the other the family medicine doctor, and was then referred to the chest physician. The 2 doctors that the patients visited initially did not recognize the unusual pattern of this syndrome, so the correct diagnosis and appropriate treatment were delayed. With greater awareness of this symptom complex, correct diagnostic studies can be employed earlier. According to the guidelines for MAC pulmonary diagnosis and treatment put forth by the American Thoracic Society in 1997, pulmonary MAC infection can be confirmed and treatment should be started with 3 consecutive sputum cultures showing positive for MAC, plus clinical symptoms and a progression in the chest roentgenograms, pulmonary MAC infection can be confirmed and treatment should be started [9].

In conclusion, Lady Windermere’s syndrome is an atypical presentation of non-tuberculous mycobacterial infection. The correct diagnosis may be delayed or missed in this group of patients unless this unusual pattern is recognized and appropriate diagnostic studies employed. A greater awareness of this symptom complex should provide a greater understanding of the pathogenicity of MAC.

References

Lady Windermere’s Syndrome

Lady Windermere’s 症候群

涂川洲 沈光漢 許正園

在 1992 年 Lady Windermere’s 症候群第一次被使用來描述年老婦女之前無任何肺疾病病史，之後卻發生右肺中葉及左肺舌葉鶴型分支桿菌感染。右肺中葉及左肺舌葉有較長及較窄之氣管，也缺乏側枝通氣，所以較易導致感染及發炎。此外，一般婦女普遍認為吐痰是社會不能接受的行為。如此的刻意壓抑咳嗽，更會造成痰液無法清除乾淨，引發慢性發炎及後續鶴型分支桿菌感染。(胸腔醫學 2005; 20: 484-489)

關鍵詞：右中葉氣管擴張、左舌葉氣管擴張、肺部鶴型分支桿菌感染、Lady Windermere’s 症候群