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Middle lobe syndrome in left lower lobe.

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Key words: Middle lobe syndrome; pulmonary atelectasis; bronchiectasis.

Abstract. Middle Lobe Syndrome is a term that refers to a persistent or recurrent collapse of a lung lobe, especially the right middle lobe. A 66-year-old woman presented with chronic cough with sputum and recurrent attacks of pneumonia. She was treated with antibiotics. Chest CT-scan showed a left lobe atelectasis and multiple foci of bronchiectasis. Bronchoscopy revealed a patent left lower lobe bronchus. In conclusions, middle lobe syndrome can rarely affect left lower lobe. It should be kept in mind in the differential diagnosis of recurrent pneumonia.

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Síndrome del lóbulo medio en el lóbulo pulmonar izquierdo inferior.

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Palabras clave: síndrome del lóbulo medio; atelectasia pulmonar; bronquiectasia.

Resumen. El síndrome del lóbulo medio (SLM) es un término que se refiere a un colapso persistente o recurrente de un lóbulo pulmonar, especialmente del lóbulo medio derecho. En este reporte, se presenta el caso de una mujer de 66 años que presentaba tos crónica, acompañada de esputo y de ataques recurrentes de neumonía. Ella fue tratada con antibióticos. El CT-scan del tórax mostró atelectasia del lóbulo izquierdo y focos múltiples de broncoectasia. La broncoscopia reveló un bronquio del lóbulo inferior izquierdo sin obstrucción. En conclusión, el síndrome del lóbulo medio, afecta muy raramente el lóbulo inferior izquierdo y debe tenerse en cuenta en el diagnóstico diferencial de la neumonía recurrente.

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INTRODUCTION

The term Middle Lobe Syndrome (MLS) is used if the middle lobe atelectasis is chronic (with duration longer than one month) and/or recurrent (more than one episode) (1). Graham *et al*. reported 12 patients with atelectasis associated with nontuberculous pneumonia of the middle lobe in 1948 (2). Their patients had recurrent episodes of pulmonary infection. In fact, it was Brock who had first reported repeated episodes of middle lobe collapse, due to tuberculous adenopaty in 1937 and until this date, this is known as the Brock's syndrome (3). The definition of MLS subsequently has been modified to include all types of right middle lobe atelectasis, even when bronchial narrowing is not present. Middle lobe syndrome can affect all lung lobes with the exception of the left upper lobe (4). There are only two case reports of MLS affecting the left lower lobe (5,6). This is the third case report of MLS located in left lower lobe.

CASE REPORT

A 66-year-old woman experienced a sudden onset of difficulty breathing with cough, and purulent sputum for two weeks. She had never smoked but received radiotherapy for laryngeal cancer three years ago. Three months earlier, she had presented to the hospital with similar symptoms, and a diagnosis of bronchopneumonia was made. She was dyspneic and cachectic. There were rhonchi on chest auscultation. Pulse oximetry revealed an oxygen saturation (SpO_2) of 85% without oxygen therapy. In laboratory analyses, leukocytes 13.700/mm^3, haemoglobin 11.4 g/dL, platelet 538.000/mm^3, CRP 14.8 (N:0-0.5 mg/L), glucose 86 mg/dL, urea 22 mg/dL, creatinine 0.44 mg/dL, ALT 6 U/L, AST 13 U/L, albumin 3 g/dL, Na 139 mEq/L, K 4.5 mEq/L, anti-HIV negative. Serum IgG levels were 1800 (N: 700-1600 mg/dL) in a nephelometry assay. In arterial blood gas analysis, pH was 7.41, PaO_2 62 mmHg, $PaCO_2$ 49.5 mmHg, HCO_3 29.5 mmol/L and SaO_2

92. Baseline spirometry showed FVC 1060 mL (57% of predicted), FEV1 870 mL (57% of predicted), and FEV1/FVC ratio of 82 per cent. Chest x-ray showed right upper lobe pneumonia and a double contour to the left edge of the heart was visible (Fig. 1). Chest CT-scan demonstrated a left lower lobe atelectasis, and multiple foci of bronchiectasis (Fig. 2). Fiberoptic bronchoscopy revealed a patent left lower lobe bronchus (Fig. 3). Acid-fast bacilli were not seen in bronchial lavage fluid. However, *Escherichia coli* was isolated from the cultures of the fluid. Nearly 45 days later, a routine radiological control showed that right lower lobe atelectasis still persisted (Fig. 4). One month later, the patient was referred to emergency department. She was intubated for rapidly progressive dyspnoea and transferred to the intensive care unit. In addition to left lower lobe, the left upper lobe was also collapsed (Fig. 5) and resolved spontaneously (Fig. 6) two days later.

The patient presented gangrenous, hemorrhagic, bullous lesions in the right hand. She died of disseminated intravascular coagulation caused by sepsis. Informed consent has been obtained from the patient's daughter.

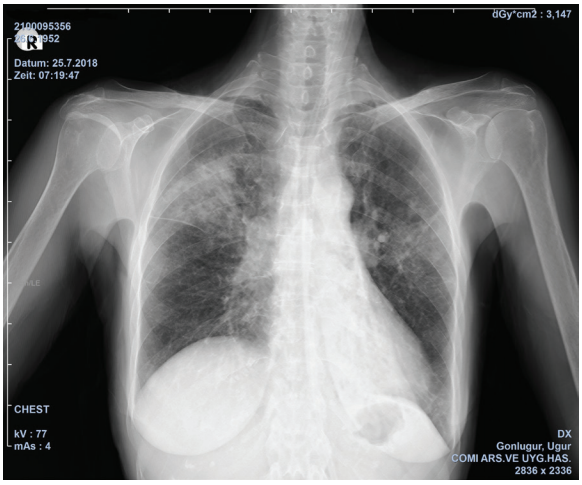

Fig. 1. Chest x-ray shows bilateral infiltrates and double-contour of the left cardiac border.

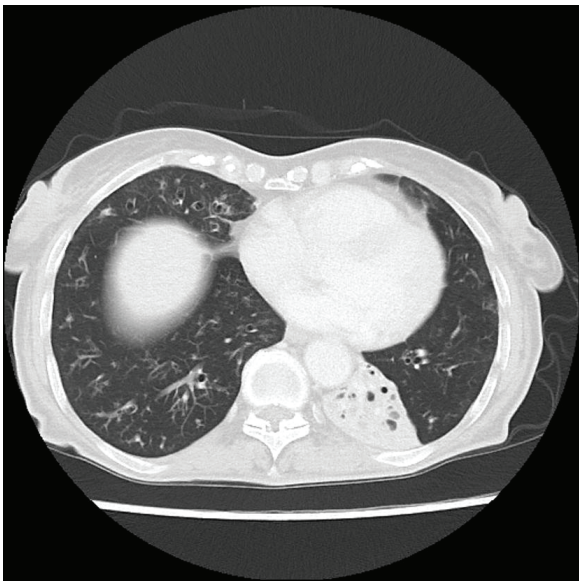

Fig. 2. Chest CT-scan demonstrates left lower lobe atelectasis and multiple foci of bronchiectasis.

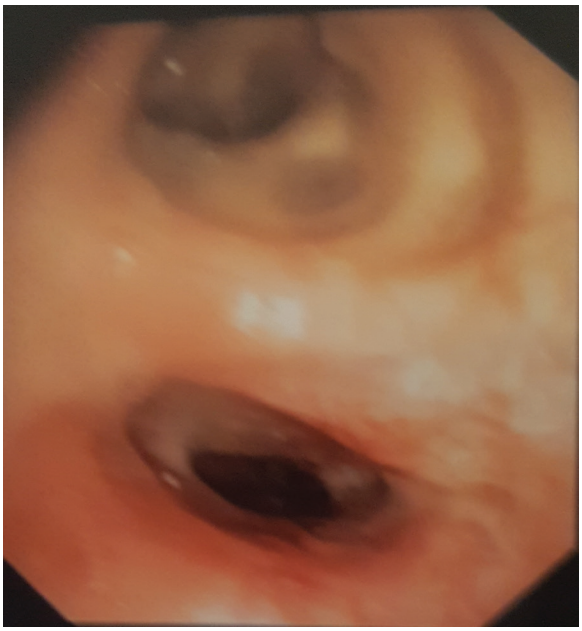

Fig. 3. Bronchoscopy shows patent lobar bronchus after the right main stem bronchus.

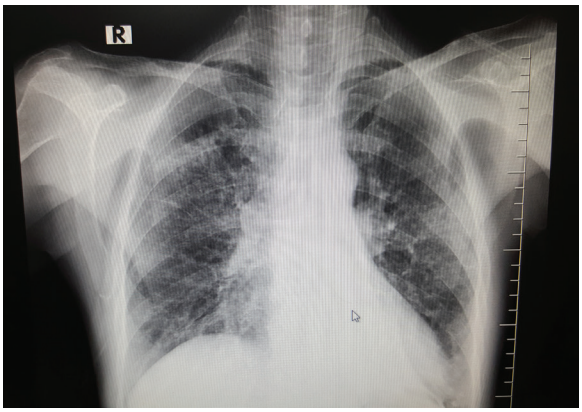

Fig. 4. A routine chest x-ray still showed a double cardiac contour suggestive left lower collapse.

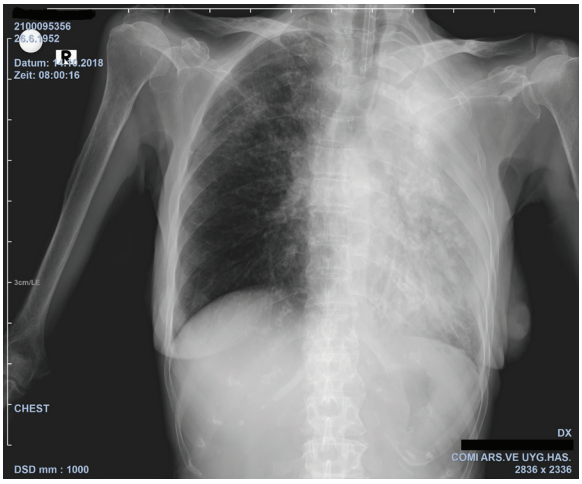

Fig. 5. Chest x-ray reveals complete white-out of the left lung due to total atelectasis.

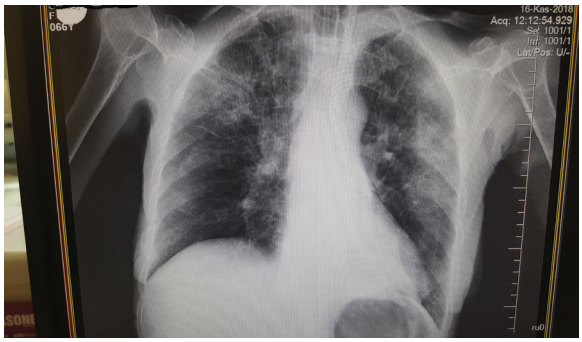

Fig. 6. Chest x-ray demonstrated collapsed left upper lobe was re-expanded.

DISCUSSION

Middle lobe syndrome is generally classified as being obstructive or nonobstructive. The obstructive type can be caused by either intrinsic obstruction or extrinsic compression (6). Tumours, tuberculosis, sarcoidosis, amyloidosis, histoplasmosis, psittacosis, allergic bronchopulmonary aspergillosis, asthma, bronchiectasis, oesophageal diverticula, perforation of the oesophagus and aspiration are the most common causes of MLS (7). It can be associated with bronchial anthracofibrosis (8), hydatid disease (9), tracheobronchopathia osteochondroplastica (10), endobronchial silicotic lesions (11), common variable immunodeficiency syndrome (12), and Lady Windermere syndrome (13).

Although the aetiology of the nonobstructive type is not completely understood, it has been suggested that ineffective collateral ventilation is a major factor in the pathogenesis of the syndrome. Resistance to collateral airflow in the middle lobe was five times higher than that of the upper lobe (14). Middle lobe syndrome has also been described in two sisters (15). This finding suggested undefined genetic alterations on the forces between lung inflation and atelectasis.

At low lung volumes, collateral airway resistance is so high that air cannot enter poorly ventilated areas (14). If an infection can cause a critical decrease in collateral ventilation, the lobe will be prone to develop atelectasis. Middle lobe syndrome has shown complete clinical and radiological remission after receiving low dose roxithromycin in two patients (16).

In some series, complete resolution of atelectasis was seen in most patients after stopping smoking for nine months or longer (17). This finding suggested a reversible phase in the disease. Animal studies have shown that adrenergic drugs can increase collateral ventilation, whereas cholinergic drugs do the opposite (14). Healing of the recurrent narrowing the lobar bronchus may

contribute to collapse by fibrosis. In the series reported by Graham and colleagues, the lobes were atelectatic with varying degrees of interstitial fibrotic changes and bronchiectasis. Submucosal loss of elastic tissue and fibrous tissue replacement of cartilage and multiple abscesses were common findings (2). Longstanding lobar collapse may result in chronic infection and destruction of a whole lobe.

In some cases, symptoms were absent and the MLS was discovered on routine chest x-ray. However, many patients have chronic cough with purulent sputum. There is often a history of multiple treatments for recurrent pneumonia or obstructive lung diseases such as asthma or chronic obstructive pulmonary disease. The ratio of females to males ranges from 1.5 to 3 (18). Recurrent pneumonia is defined as two episodes in a single year or three episodes ever, with radiographic clearing of densities between occurrences (12). Our patient had two episodes of pneumonia in six months.

Bronchoscopy is required for diagnosis to evaluate the patency of the involved bronchus (6). Our patient had nonobstructive type of middle lobe syndrome although she experienced transient total collapse during intubation. There is no consensus regarding the indication for surgical removal in middle lobe syndrome. Patients who do not respond to conservative therapy can be offered surgical removal before the development of a destroyed lobe (18).

In conclusion, MLS should be considered for patients presenting with recurrent pneumonia, the picture is significantly underdiagnosed in the elderly population. It can rarely involve left lower lobe.

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