A 61-year-old man with a smoking history of 30 pack-years, but no relevant disease was evaluated for kidney donation to his wife, who suffered from end-stage renal disease. Routine testing before kidney donation consisted of the patient’s history, laboratory measurements, ECG, ultrasound of the abdomen and a chest X-ray. The leukocyte number, hemoglobin level and platelet count in the blood were normal. Laboratory parameters including C-reactive protein, serum creatinine, liver enzymes and the lipid profile were also within the normal range. Therefore, the patient was considered to be a suitable candidate for living unrelated kidney donation. However, the chest X-ray showed a dense infiltrate in the lingula (fig. 1) close to the pericardium as shown on CT scan (fig. 2). Lung function tests revealed normal volumes (FEV$_1$ 2.6 litres, 93% of predicted; FVC 3.39 litres, 98% of predicted), a normal diffusion capacity and normal arterial blood gases. HbCO was moderately elevated (4.1%). The patient denied any respiratory symptoms. Bronchoscopy was performed and showed a normal bronchial system. Bronchial brushing and bronchial washings from the lingula revealed no bacteria, mycobacteria or malignant cells.

*What is your diagnosis? What is your next diagnostic step?*

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**Fig. 1.** Chest X-ray showing an infiltrate situated close to the pericardium and pleural space.

**Fig. 2.** Thoracic CT-scan showing a dense localized infiltrate in the lingula.
**Diagnosis: Primary Pulmonary Low-Grade B Cell Non-Hodgkin Lymphoma**

Fig. 3. Histology of tissue obtained at thoracoscopy showing centrocyte-like cells characteristic for MALT lymphoma of the lung. Paraffin section. HE. × 2,500.

Fig. 4. Strongly CD20-positive lymphoma cells. Paraffin section. Immunostaining with the ABC method. × 2,500.

Fig. 5. Cytologic smear from bronchial lavage: lymphoid cells CD20-positive. ABC immunostain over Papanicolaou-stained smear. × 2,500.

**Diagnostic Procedures**

As a next diagnostic step CT-guided transthoracic lung biopsy was performed. Unfortunately, this procedure was complicated by a pneumothorax with collapse of the left lung before any tissue could be obtained. Because pleural drainage was needed to treat the pneumothorax, thoracoscopy under local anesthesia was immediately performed, including a forceps biopsy of pleural tissue and lung tissue from the lingula. Histology revealed dense infiltration of the tissue by small lymphoid cells (fig. 3). Lymphocytes stained positive for CD20, a marker for B lymphocytes (fig. 4). There were few CD3+ T cells. Based on histological findings and immunostaining, the diagnosis of a pulmonary low-grade B cell non-Hodgkin lymphoma was made. Treatment consisted of resection of the lingula and 2 segments of the left lower lobe followed by radiotherapy. The patient was deemed unsuitable for kidney donation.

**Comment**

Primary pulmonary non-Hodgkin lymphomas are rare extranodal lymphomas which are usually low-grade B cell types and are considered to originate from mucosa-associated lymphoid tissue (MALT) of the bronchus [1–3]. The lungs are a primary site of lymphoma in less than 0.5% of patients with non-Hodgkin lymphoma. Diagnosis is usually based on lung biopsy but can occasionally be achieved by less invasive techniques. Diagnosis of MALT lymphoma has been described using bronchoalveolar lavage, bronchial or transbronchial biopsies [4, 5]. In our case, bronchial washings and bronchial brush showed marked lymphocytosis, and tuberculosis was discussed. However, immunostaining which was performed after lung biopsy was obtained, revealed 94% CD20+ cells and only 4% CD45R+ lymphocytes in the bronchial lavage fluid (fig. 5). Therefore the diagnosis of B cell non-Hodg-
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kin lymphoma might have been made without lung biopsy. Half the patients with the diagnosis of primary lymphoma of the lung do not report respiratory symptoms [6]. If present, symptoms are nonspecific (cough, mild dyspnea, hemoptysis, chest pain). Imaging features consist of localized opacities with alveolar masses or pneumonia-like consolidations, sometimes pleurally based. An air bronchogram is present in about half the cases. Diffuse infiltrates or opacities involving both lungs are rare. If histology shows low-grade lymphoma, the prognosis is good. Ten-year patient survival is above 50%. It is not yet clear whether chemotherapy is superior to surgical excision with or without radiotherapy.

Message

If bronchoalveolar lavage fluid obtained from the site of localized infiltrates shows a high percentage of lymphocytes, primary MALT lymphoma of the lung should be considered as a diagnosis and immunostaining of the lymphocytes should be performed. A B cell percentage exceeding 10% is highly suggestive of B cell non-Hodgkin lymphoma.

Key Words

- Pulmonary infiltrates
- MALT lymphoma
- Bronchoalveolar lavage

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