A case of B-cell lymphoma of Bronchus-Associated Lymphoid Tissue (BALTOMA) masquerading as an atypical interstitial pneumonia

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Citation

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Abstract

We describe a 60-year-old patient with symptoms of chest pain, chronic non-productive cough, generalised malaise and weight loss for four years. Bilateral interstitial infiltrates were observed radiologically. Bronchoscopy with bronchoalveolar lavage (BAL) came back positive for Mycobacterium Xenopi. She was treated with rifampin, ethambutol and azithromycin for 6 months but no clinical improvement. She became progressively dyspneic and subsequently had a Video-assisted thorascopic surgery (VATS) and histological examination of lung biopsy revealed replacement of normal lung parenchyma with diffuse infiltration of monotonous cells with scanty cytoplasma and little nuclear irregularity. In immunohistochemical examination it was detected that the LCA and B cell markers of the cells were stained positive for CD20 and CD79; whereas epithelial markers were stained negative for cytokeratin and EMA, and T cell markers were stained negative for CD3. The molecular path revealed Ig heavy chain gene clonal rearrangement consistent with neoplastic proliferation of the B-cell lineage. These features were compatible with the diagnosis of primary pulmonary BALT (bronchus-associated lymphoid tissue) lymphoma or BALTOMA. We recommend that BALTOMA should be included in the differential diagnosis of patients with slow-progressing nonspecific pulmonary symptoms and radiographic interstitial infiltrates. Biopsy under CT guidance or VATS provides sufficient tissue in peripheral lung lesions for immunologic studies to assist in diagnosis.

INTRODUCTION

B-cell lymphoma of bronchus-associated lymphoid tissue (BALT) or baltoma is defined as low-grade non-Hodgkin's lymphoma presenting in the lung either unilaterally or bilaterally and showing no evidence of involvement of other sites (other than hilar lymph nodes) at the time of presentation or in the following 3-month period. Such lymphomas represent less than 0.5 percent of all primary lung tumors [1].

Lymphoid proliferations of the lung represent a rare collection of lesions, including primary pulmonary lesions, manifesting an array of presentations from reactive hyperplasia to highgrade malignant lymphoma. Pulmonary lesions with histologic characteristics such as infiltrate of mature lymphocytes and true germinal centers without lymph node involvement had been diagnosed as pseudolymphomas [2]. However, more recently the production of monoclonal antibodies in molecular biology have allowed specific and precise analyses of lymphoproliferative disorders of the lung, most of which have been classified as benign because of their indolent clinical course [3]. Previously described pseudolymphoma was shown to be a heterogenous disease group, including nodular lymphoid hyperplasia and low-grade B-cell lymphoma arising from the bronchus-associated lymphoid tissue [4].

BALTOMAs are thought to arise in either mucosa-associated lung tissue or interbronchial nodes or lymphatic channels. This indolent lymphoma is often multicentric or diffuse and most often involves small B lymphocytes. Lymphoid proliferation may present as isolated masses, peribronchial proliferation or interstitial infiltration [5].

VATS-related lung biopsy or open biopsy is usually suggested for definite diagnosis of pulmonary lymphoproliferative disorders if transbronchial biopsy and transthoracic fine-needle aspiration biopsy could not provide sufficient tissue for immunologic studies [1,6].

We present a case of BALTOMA diagnosed by VATS biopsy along with review of literature.

CASE PRESENTATION

A 60-year-old female with Past Medical History of Asthma, Hypothyroidism, Raynaud's Phenomenon, Left Adrenal Adenoma was admitted to our institution in January 2008, with a 4-year history of chronic intermittent pleurisy, nonproductive cough, generalized malaise, arthralgias and weight loss of 20 pounds in the past 6 months. She had a prior Bronchoscopy with BAL 6 months ago that came back positive for M. Xenopi and she was started on Rifampin, Ethambutol and Azithromycin. However she continued to experience these pulmonary symptoms. She denied ever smoking or drinking alcohol or any illicit drug use. She had been treated for hypothyroidism and asthma. She denied any chemical or heavy metal exposure. Open lung biopsy had been suggested for definite diagnosis but for unknown reasons was not done.

Physical examination was significant for decreased chest expansion and dullness to percussion with decreased breath sounds over bibasilar lung fields. End-inspiratory crackles were also present. No egophony or whispered pectiroloquy could be appreciated. There was no palpable peripheral lymphadenopathy (LAP).

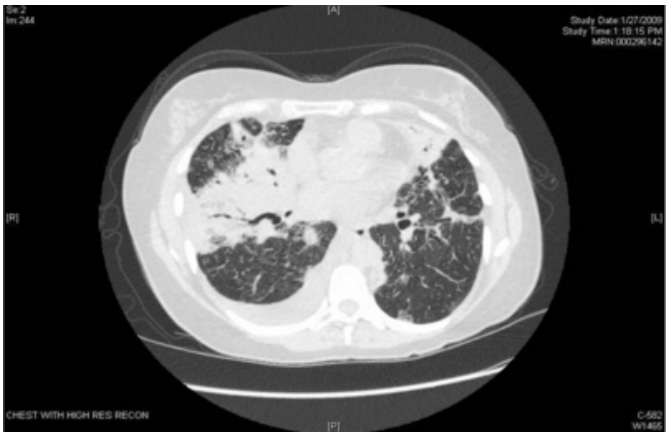
Laboratory studies included a Hemoglobin 12.2 mg/dl, WBC 13.800/mm3 (PNL 52.7%, lymphocyte 35.2%, monocyte 9.6%, eosinophil 1.6%) Plt 500. Erythrocyte sedimentation rate was 90 mm/h. AST 17 ALT 10.Serum C-reactive protein was high whereas rheumatoid factor was negative.

There was significant progression in radiologic findings. Chest radiography on admission to hospital revealed left hilar density and bilateral upper lobe consolidations (more prominent on right side).

CT Scan of the Chest (Figure 1) yielded small multifocal infiltrates with small R effusion, multiple mediastinal LAP, airspace consolidations in right upper and middle lobe lateral segment next to the chest wall and left upper lobes with air bronchograms

Figure 1

Figure 1



In fiberoptic bronchoscopy, no endobronchial lesion was observed. Histopathological examination of VATS mucosal biopsy specimens were carried out.

Histological and immunohistochemical findings: Histological examination of lung biopsy revealed replacement of normal lung parenchyma with diffuse infiltration of monotonous cells with scanty cytoplasma and irregular nuclei. Path revealed Lung alveoli and respiratory epithelium with surrounding lymphoid proliferation (Figure 2 and 3)

Figure 2

Figure 2

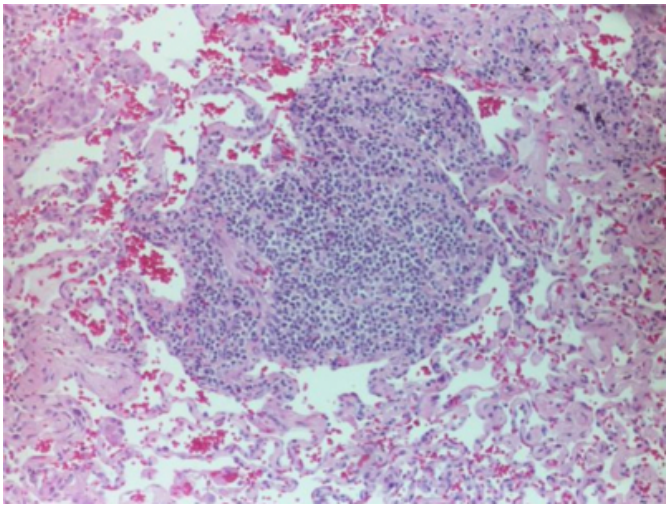


Figure 3

Figure 3

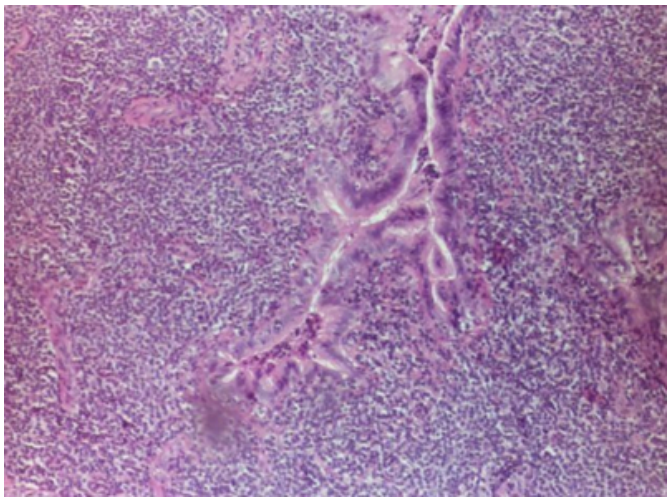
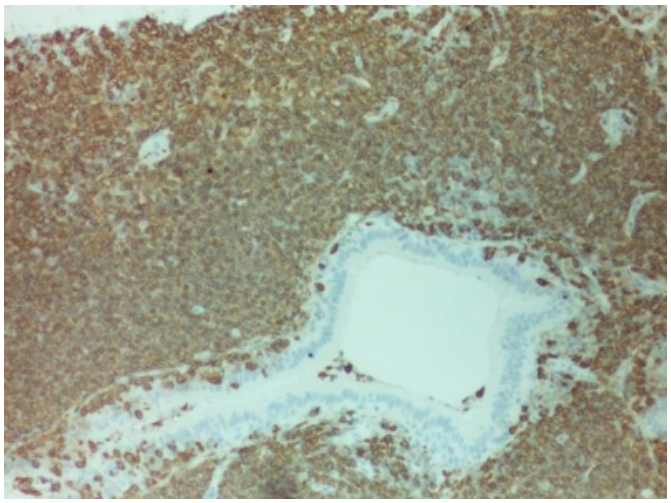


Figure 4

FIGURE 4 Immunoperoxidase stain L26 (CD20) showing B cell origin



The patient is currently undergoing staging workup for further evaluation and management.

DISCUSSION

B-cell lymphoma of bronchus-associated lymphoid tissue is also called a BALTOMA. It is an indolent type of lymphoma[1]. These tumors are rare and are often recognized on routine chest radiographs of middle-aged patients since they produce minimal symptoms [7]. Patients may have cough, chest pain, hemoptysis, dyspnea. Systemic symptoms of lymphoma such as fever, night sweats and weight loss may be present [7,8].

Chest Xrays of BALTOMAs are usually non-diagnostic: diffuse infiltrates, reticulonodular infiltrates, small and large nodules and effusions may be seen [8]. The most common CT appearance of a BALTOMA is consolidation with air bronchograms [8]. Lee at al [2] described CT findings of 10 patients (age range 43-73 years). Seven of those ten patients presented with abnormal chest radiograph even though they were asymtomatic. Symptoms in the remaining patients were cough, dyspnea, fever and sputum. None of them had any underlying diseases. CT scans demonstrated 60% airspace consolidation, 60% single or multiple nodules, 70% focal areas of ground-glass attenuation adjacent to consolidation or nodules with irregular margin and 30% mediastinal lymphadenopathy. Air bronchogram inside the lesions was found in 90% of cases. Our patient presented with bilateral airspace consolidations with air bronchograms on her radiographs.

Diagnosis is both practically feasible and reproducible by transbronchial biopsy or transthoracic needle aspiration biopsy as well [7]. Kuruvilla et al [8] also reported cases of primary pulmonary lymphoma diagnosed by transthoracic fine-needle aspiration biopsy.

Indeed our case highlights and reminds us of the importance of tissue diagnosis. Our patient did not get an open lung biopsy before and BAL positivity misdiagnosed her with an atypical mycobacterial pneumonia.

Microscopically baltomas have the features common to MALT (mucosa-associated lymphoid tissue) lymphomas in general but adapted to their bronchopulmonary location. The infiltrate is basically interstitial. The neoplastic cells have a variable morphology that corresponds to the variants of the centrocyte-like cells. Immunocytochemistry is important in establishing the B lineage of the lymphoma cells [1,6]. Our case report has typical histopathologic findings of a BALTOMA.

We recommend that BALTOMA should be included in differential diagnosis of patients with chronic pulmonary symptoms or an atypical pneumonia that does not respond to antibiotics. Diagnostic workup should include lung biopsy and sufficient tissue sample from peripheral lung lesions should be obtained for immunologic studies.

References

1. Harris M. Pulmonary Lymphoproliferative Disorders and Related Conditions. In: Hasleton PS, Ed. Spencer's Pathology of the Lung. New York, McGraw-Hill, 1996;1111-30.
2. Lee DK, Im JG, Lee KS, et al. B-cell lymphoma of

bronchus-associated lymphoid tissue (BALT): CT features in 10 patients. J Comput Assist Tomogr 2000;24:30-4.
3. Bragg DG, Chor PJ, Murray KA, Kjeldsberg CR. Lymphoproliferative disorders of the lung: histopathology, clinical manifestations and imaging features. Am J Roentgenol 1994;163:273-81.
4. Harris ML, Jaffe ES, Stein H, et al. A revised European-American classification of lymphoid neoplasms: A proposal from the International Lymphoma Study Group. Blood 1994;84:1361-92.
5. Kradin RL, Mark EJ. Benign lymphoid disorders of the lung, with a theory regarding their development. Hum Pathol 1983;14:857-67.
6. Flieder DB, Youfem S. Pulmonary Lymphomas and Lymphoid Hyperplasia. In: Knowles DM, Ed. Neoplastic Hematopathology. Philadelphia, Lippincott Williams&Wilkings; 2001:1263-302.
7. Schmitt-Graff A, Raff T, Rahn T, et al. Primary pulmonary B-cell lymphoma of the MALT type. Pathologe 1995;16:328-35.
8. Kuruvilla S, Gomathy DV, Shanthi AV, et al. Primary pulmonary lymphoma. Report of a case diagnosed by fine needle aspiration cytology. Acta Cytol 1994;38:601-4.

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