A Case of Primary Pulmonary Diffuse Large B-Cell Lymphoma Diagnosed by Transbronchial Biopsy

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A 76-year-old man took a chest X-ray for his medical checkup and an abnormal shadow was detected in the right lower lung field. For more detailed examination, he was referred to our hospital. Chest computed tomography showed a 20-mm nodule with relatively regular margins in the right lower lobe. A compact proliferation of circular to polygonal cells with a high nucleus-cytoplasm ratio was evident in a transbronchial lung biopsy. Based on pathological findings, a mature large B-cell lymphoma was diagnosed. Thoracoscopic right lower lobectomy and mediastinal lymphadenectomy were performed. The post-surgical pathological examination showed that the tumor consisted of diffuse to compact proliferation of medium to large atypical lymphocyte-like cells. Immunohistochemical staining yielded positive results for B-cell lineage markers. Five months after surgical resection, neither local recurrence nor accumulation in remote organs was observed on gallium scintigraphy. The diagnosis of primary pulmonary diffuse large B-cell lymphoma was established.

Keyword: Primary pulmonary lymphoma, diffuse large B-cell lymphoma, non-Hodgkin lymphoma, bronchoscopy

Introduction

Primary pulmonary lymphoma (PPL) is rare, and diffuse large B-cell lymphoma (DLBCL), a mature large B-cell lymphoma, is the second most type of PPL. The biological features, clinical presentation, prognosis markers, and treatment of PPL-DLBCL have not been well defined.1)

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Received: October 29, 2014; Accepted: December 31, 2014
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from the place where I did hit for a tumor, and compact proliferation of circular to polygonal cells with high nucleus-cytoplasm ratio was evident. Morphological findings based on hematoxylin-eosin staining suggested several different diagnoses including a carcinoid tumor and small cell carcinoma. However, immunohistochemistry showed expression of vimentin, leukocyte common antigen (LCA), cluster of differentiation (CD) 20, CD79a, and CD99 but not of CD3, CD5, CD10, or thyroid transcription factor (TTF)-1. Based on these findings, mature large B-cell lymphoma was diagnosed (Fig. 2). The MIB-1 index ranged from 80% to 90% Ki67-positive nuclei. On the basis of the FDG-PET/CT and bronchoscopy findings, malignant PPL was diagnosed, and surgery was planned because the lesion was localized. This patient had no history of immunosuppressive drug use. A thoracoscopic right lower lobectomy and a mediastinal lymphadenectomy were performed. Carcinoid and small-cell carcinoma were originally considered on the basis of the findings of the bronchoscopic examination; moreover, the imaging findings were suggestive of carcinoid. Therefore, we performed lymphadenectomy to assess how much the lesion had spread. The post-surgical pathological examination showed that the tumor consisted of a diffuse to compact proliferation of medium to large atypical lymphocyte-like cells (Fig. 3). Immunohistochemical staining yielded positive results for LCA, CD20, CD79a, paired box protein (PAX)-5, and B-cell lymphoma (BCL)6 and negative results for CD3, CD5, CD10, CD23, CD45RO, cyclin D1, and BCL2. Based on these results, the mature large B-cell lymphoma was diagnosed as a DLBCL. Five months after surgery, neither local recurrence nor accumulation in remote organs was observed via gallium scintigraphy, and bone marrow aspiration yielded no abnormal findings. The patient was diagnosed with PPL and indicated for adjuvant chemotherapy because of the malignancy of the tumor and referred to the department of hematology. Considering the patient’s old age, 3 cycles of the THP-COP regimen with pirarubicin (4’-O-tetrahydropyranyladriamycin, THP), cyclophosphamide, vincristine, and prednisolone were administered.

**Discussion**

Extranodal lymphomas are most frequently found in the gastrointestinal tract, and PPLs are extremely rare. PPLs represent <1% of primary malignant lung tumors, <1% of lymphomas, and only 3%–4% of extranodal lymphomas. A commonly used set of criteria for PPLs...
proposed by L’Hoste and associates is lymphoma with involvement of the lung, lobar, or primary bronchus, with or without mediastinal involvement, and no evidence of extrathoracic lymphoma at the time of diagnosis or for 3 months thereafter. The most common PPL type is mucosa-associated lymphoid tissue (MALT) lymphoma, an extranodal marginal zone lymphoma that accounts for 80%–90% of PPL cases. DLBCL is the second most common type of PPL, and both MALT lymphoma and DLBCL are non-Hodgkin lymphomas.\(^4,5\) PPL-DLBCL has been associated with immunosuppression; although non-immunosuppressed patients have been reported in some series. Because of the small number of PPL-DLBCL cases, it is very difficult to draw definitive conclusions about its clinical features and treatment.\(^1\)

Pulmonary MALT lymphoma usually has an indolent course, remaining localized to the lung for long periods before dissemination. Although less frequent, DLBCL is believed to have a poorer prognosis than MALT lymphoma.\(^3\)

The radiological aspect (in 50%–90% of PPL cases) is a localized alveolar opacity, with a diameter of <5 cm and blurred or well-defined contours (according to the series); PPL is associated in nearly 50% of cases with an air bronchogram,\(^6\) and peribronchial disease, proximal bronchiectasis, and positive CT-angiogram signs are ancillary features.\(^7\)

In the present case, radiography showed a nodular opacity with regular margins, which can be considered atypical. The radiographic appearance of the nodular opacity showed a variety of findings, which suggests that any radiological abnormality in the lung parenchyma is a potential lymphoma.\(^9\) FDG-PET has been regarded as the gold standard for lymphoma imaging. However, because PPL has low FDG involvement, the benefit of FDG-PET in the clinical assessment of PPL is speculative.\(^3\) Bronchoscopy is thought to be of limited value, as for diagnosis of PPL because endobronchial changes in PPL are rare.\(^3,9\) However, in the present case, our diagnosis was made via bronchoscopy. Therefore, even if malignant lymphoma is suspected on images, bronchoscopy may be effective.

Although there is no consensus on the treatment of PPL, surgical resection is generally performed in cases of localized tumors.\(^2\) Because the rate of local recurrence after complete resection is reported to be high, adjuvant chemotherapy or radiation therapy should be considered for non-MALT lymphomas.\(^8\) Because our patient had DLBCL and a high MIB index, chemotherapy was planned at the department of hematology.

**Conclusion**

In the present case, a nodular opacity with regular margins was detected by radiography, which was an atypical imaging finding. We believe PPL should be considered if images similar to those seen in our case are obtained. Diagnosing this disease via bronchoscopy is considered difficult. However, in our case, preoperative bronchoscopy suggested lymphoma and allowed us to identify the disease type by analogy. Even if a lymphoma is suspected on images, bronchoscopy may be useful.

**Conflict of Interest**

None declared

**References**