1. Introduction

PPDLBCL is a kind of non-Hodgkin lymphomas arising from lung tissue. It is extremely rare and observed only in 10% cases of primary pulmonary non-Hodgkin lymphoma. Because of nonspecific clinical symptoms, it might be misdiagnosed as infection, tuberculosis or even lung cancer. The criteria for the diagnosis of PPDLBCL include the following: pathological and immunohistochemical features of DLBCL, a primary lesion restricted to the lung with or without minimal hilar lymph node involvement, and clinical, radiological, and pathological exclusion of the disease at distant sites. A few cases of PPDLBCL were reported in recent years. While, when it met diagnostic criteria of PPDLBCL, diagnosis of PPDLBCL should not be made immediately. An extremely unique situation must be considered and it is coexistence of PPDLBCL with other cancers, including lung cancers and cancers transferred to lungs, such as breast cancer. Tissue samples should be took at different parts of tumors to achieve precise diagnosis. Only by doing this, suitable treatment regime can be chosen.

In this report, we described a female patient who was diagnosed as PPDLBCL and lung adenocarcinoma. Two different malignant tumor cells were found at the same mass. Chemotherapy regime used clinically for treatment of lung adenocarcinoma and DLBCL was used. After treatment, the patient was completely recovered and kept healthy for 3 years till present.

2. Case report

A 60-year-old female patient presented with left chest pain came for our help in January, 2013. She had no fever, night sweats, chills and chronic cough and was a nonsmoker. The physical examination did not reveal any significant abnormalities. CT scan showed a 6.0 cm × 4.0 cm × 2.0 cm upper left chest wall mass (Fig. 1). Needle biopsy through the chest wall revealed a adenocarcinoma of lung. No metastasis was discovered. As there were no surgical contraindications, the patient then was admitted to clinical thoraco-surgery to remove the tumor. Immunohistochemical assay revealed both a lung adenocarcinoma and a large B cell-type lymphoma (DLBCL). The tumor was immunoreactive for Vim, CD20, CD79a and CD45 (partly), and nonimmunoreactive for NapsinA, S-100 and ALK (Fig. 2). Both lung adenocarcinoma cells and B cell lymphoma cells were surrounded by inflammation cells (Fig. 3).

She completed 4 cycles of chemotherapy with gemcitabine, cisplatin (GP) regimen and 2 cycles with cyclophosphamide, doxorubicin, and cisplatin (AP) regimen.
Fig. 1. Thoracic CT scan. a–b. Before surgery, a tumor can be observed at upper left chest wall, c–d. Review of the third year, tumor is removed and no recurrence is observed.

Fig. 2. Surgical biopsy of collision tumor. a. Lung adenocarcinoma (H&E staining), b. Diffuse large B cell lymphoma (H&E staining), c. Immunohistochemical assay revealed positive of CD20(c).

Fig. 3. Malignant tumor cells are surrounded by inflammation cells. a. Inflammation cells locate around lung adenocarcinoma cells, b. B cell lymphoma cells are surrounded by inflammation cells.
adriamycin, vincristine, prednisone (CHOP) regimen. Reexamination of chest CT showed the mass was disappeared (Fig. 1). The patient kept healthy without tumor recurrence ever after.

3. Discussion

The simultaneous occurrence of two histological distinct tumors at the same site might be caused by different biologic reasons. In some cases, variable tumors may develop simultaneously as a result of a pure coincidence which was called “collision tumors”\(^5\). In fact, in addition to the same site, collision tumors can also occur within adjacent organs or in conjunction with a systemic malignancy or as a metastatic phenomenon\(^7\). The mechanisms for collision tumors were still unclear and two of them have been proposed, including (1) alteration of regional microenvironment by an already present tumor, which lead to increased risk of developing the other tumor. For example, accumulation of large number of inflammation cells caused by existence of one cancer can promote cell proliferation, which is an important pathogenesis of malignant tumors. (2) Two malignant cells in collision tumor originated from carcinogenesis of a common stem cell\(^6\). In this case, the possibility of lung adenocarcinoma and DLBCL coming from the same stem cell was small as the two kinds of tumor cells originated totally from different progenitor cells. The mechanism driving this collision tumor more inclined to the change of local microenvironment caused by one tumor, leading to developing of another one. While, which one appeared earlier was unclear. It is well known that a gene mutation can lead to several tumors, such as RAS gene mutation, which will cause pancreatic cancers or colorectal cancers. Collision tumors may also be a result of a gene mutation, but evidence can prove this guess is not much. In one case, the authors reported that they found over-expression of IL-17A and CD70 gene in a collision tumor made up of primary laryngeal mucosal melanoma and invasive squamous cell carcinoma\(^8\).

In the present case, lung adenocarcinoma and DLBCL were discovered at the same mass located in left lung. It is the first report of such unique collision tumor, to our knowledge. The tumor stains for CD20 and CD79a, which are markers of B-lineage. While, Napsin A, frequently used to classify a tumor of unknown origin as lung primary, is lack of staining. It was reported that anaplastic lymphoma kinase-positive diffuse large B cell lymphoma (ALK-DLBCL) was positive in expressing Napsin A\(^1\). Our result of ALK was negative, which was a supplement for the former report. We guess that Napsin A might be used as a new marker for ALK-DLBCL. Testing of ALK is relatively expensive and replacing it with Napsin A would reduce the payment. While, the guess need to be furtherly studied.

There is no standard chemotherapy choice after operation because no such cases had been reported before. We designed therapeutic scheme according to the character of the neoplasm. Considering the collision tumor was made up with lung adenocarcinoma and DLBCL, GP regime was utilized for 4 cycles of chemotherapy, which is effective for both lung adenocarcinoma and lymphoma. Clinically, DLBCL needs 6 cycles of chemotherapy, so CHOP regime, which is the first choice of DLBCL, was added to meet the dose requirement and used for another 2 cycles. After surgery and chemotherapy, the patient is completely recovered. No recurrence was observed by regular review for 3 years. The successful treatment of the patient provides us with a therapeutic scheme for reference.

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References