

## Case Report

# Synchronous Occurrence of Hodgkin's Lymphoma and Lung Cancer

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Received: February 01, 2021; Accepted: February 26, 2021; Published: March 05, 2021

## Abstract

Hodgkin lymphoma is an uncommon neoplasm that characterized young age of onset, Hodgkin and Reed-Sternberg (HRS) cells derived from B-lymphocytes and a high cure rate, even when the patient presents with advanced metastatic spread. Lung cancer is the most common cancer worldwide and is still responsible for the most cancer deaths. We present an extremely rare case of coexisting Hodgkin lymphoma and lung cancer in a 67-year-old male patient. He initially presented with chest pain. Pet/ct revealed mass in the right lung and lymph nodes in the neck. Biopsy from the premaxillary lymph node was compatible with classical Hodgkin lymphoma. In terms of second primary malignancy, a biopsy was also performed from the mass in the right lung. Pathology showed a pulmonary adenocarcinoma and a right upper lobectomy was then performed. This patient was treated with gemcitabine plus docetaxel for lung cancer. At the end of treatment pet/ct was complete response including lymph nodes in the neck. Therefore, we did not give any treatment for Hodgkin lymphoma. The patient is still being followed up in remission.

**Keywords:** Hodgkin lymphoma; Lung cancer; Synchronous; Cancer therapy

## Introduction

Hodgkin Lymphoma (HL) is a rare B-cell malignant neoplasm involving lymph nodes and the lymphatic system. The disease has a bimodal disease distribution and its incidence has increased in patients in their 20s and over 55 years of age [1]. In 2020, an estimated 8480 people will be diagnosed with HL in the United States and 970 people will die from the disease [2]. HL is divided into two major subgroups, based on morphology and immunophenotype: classic Hodgkin Lymphoma (cHL) and Nodular Lymphocyte-Predominant Hodgkin Lymphoma (NLPHL) [3]. cHL accounts for approximately 90 percent of HL, while NLPHL accounts for the remainder of cases [4]. Pathology is an important means of diagnosis and classification. The treatment of patients with HL is primarily guided by the clinical stage of the disease. Early-stage disease is treated with a combination of chemotherapy plus radiation therapy, while advanced stage disease receives a longer course of chemotherapy without radiation therapy [5].

Lung cancer is the most common cancer and leading cause of death in both men and women worldwide. GLOBOCAN estimated 2.09 million new cases and 1.76 million deaths worldwide in 2018 [6]. Among the common subtypes of lung cancer, Non-Small Cell Lung Cancer (NSCLC) accounts for 80-85 % of all cases and small cell lung cancer accounts for the remaining 15-20%. Among non-small cell variants, adenocarcinoma is the most common type in contemporary series, accounting for approximately one-half of lung cancer cases [7]. Surgery, RT, chemotherapy and molecular targeted therapies are the modalities most commonly used to treat patients with NSCLC. They can be used either alone or in combination depending on the disease status [8].

Multiple studies have reported an increased risk for lung cancer as secondary neoplasms after treatment for HL patients [9-11]. However, we could not find synchronous lung cancer and Hodgkin lymphoma in the literature. The aim of this study is to present the first case of incidental discovery Hodgkin lymphoma and lung cancer.

## Case Presentation

A 67-year-old man was admitted to our hospital on June 2019 due to chest pain and clinically significant weight loss that had been apparent since May 2019. Since the symptoms first occurred, the patient had experienced no night sweats or fever. The patient's medical history included heavy smoker and appendectomy. On physical examination, there was no pathology except prolonged expiration. Laboratory findings were within normal limits except for mild anemia. Firstly, plain chest radiography was obtained, which revealed a mass in the right lung. Pet/ct was performed for further evaluation, which revealed a right lung upper lobe posterior mass measuring 65x58 mm (SUV max:16.7) and suspected in terms of metastasis in the neck, lymph nodes with the largest size of 14x9 mm (SUV max:15) was detected at left level 2 b and premaxillary. Biopsy from the premaxillary lymph node was compatible with classical Hodgkin lymphoma. There was no bone marrow involvement in pet/ct. According to the Ann Arbor System, Hodgkin lymphoma was classified as stage IIB.

In terms of second primary malignancy, a biopsy was also performed from the mass in the right lung. The frozen section showed a pulmonary adenocarcinoma. A right upper lobectomy was then performed confirming the diagnosis. Histopathological findings were consistent with pulmonary adenocarcinoma with TTF-1 expression. This tumor was classified pT4N0M0. The patient was primarily referred

to oncology and he was treated for pulmonary adenocarcinoma by four cycles gemcitabine plus docetaxel (gemcitabine on day 1 and docetaxel on day 1 and 8, every 21 days). At the end of treatment pet/ct was complete response including lymph nodes in the neck. Therefore, we did not give any treatment for Hodgkin lymphoma. The patient is still being followed up in remission.

## Discussion

HL are lymphoid neoplasms that characterized HRS cells. As the majority of patients with Hodgkin lymphoma achieve long-term survival free of HL, late complications of the treatment have emerged as a competing cause of death and morbidity. Long-term survivors are at risk for developing second malignancies. Solid tumors account for the most second cancers in HL survivors, with lung, breast, stomach, esophagus, colon/rectum, cervix, mouth and pharynx, and melanoma. Radiotherapy and alkylating chemotherapy can substantially increase the risk of solid malignancy, in particular risks of lung cancer, stomach, and pancreatic cancer [12]. Our patient was not treated with radiotherapy and chemotherapy. Therefore, we speculated that HL and lung cancer occurred incidentally. The relationship between the synchronous development of these two tumors remains unclear. Additional cases, therefore, need to be investigated in order to further clarify the key diagnostic and therapeutic characteristics of synchronous neoplasms.

Multiple primary cancers are defined as the occurrence of two or more primary cancers in the same patient, either simultaneously or sequentially [13]. Although synchronous lung cancer and non-Hodgkin lymphoma have been reported in the literature [14-20], we could not find any reporting synchronous Hodgkin lymphoma and lung cancer. To our best knowledge, this is the first case in the literature.

Previous studies have reported the simultaneous occurrence of HL and hematological malignancies such as chronic lymphocytic leukemia, peripheral T-cell lymphoma, or diffuse large B-cell lymphoma [21-25]. Also, Hodgkin lymphoma can be seen as synchronous or metachronous with solid tumors such as testicular germ cell neoplasm, laryngeal squamous cell carcinoma, colon carcinoma, gastric adenocarcinoma and pleomorphic adenoma [26-33].

Due to the rarity of coexisting malignancies such as this, diagnosis and treatment are the most challenging problem. In the absence of guidelines for the management of such diseases, the therapeutic management should be determined according to the physician's experience. The biological behavior of the disease, patient performance status, and the estimated morbidity related to chemoradiotherapy should be taken into account. The case must be managed using a multidisciplinary approach.

In the present case report, the patient received chemotherapy for lung cancer alone. After lung cancer treatment, the pet/ct was in complete response. Gemcitabine, which is used for lung cancer treatment, is also used in the treatment of Hodgkin lymphoma, especially in salvage therapy. We think that lymph nodes in the neck may have responded to this treatment. Therefore, we preferred wait and watch for HL treatment. The patient was still in remission and in good health 12 months later. In conclusion, biopsy of the

suspicious lymph nodes should be performed to confirm malignancy metastasizing from lung cancer or other lesions. Similarly, in HL patients with suspicious lung mass, a biopsy should be performed to exclude lung cancer.

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