Respiratory Medicine Case Reports 25 (2018) 300–302

Contents lists available at ScienceDirect

Respiratory Medicine Case Reports

journal homepage: www.elsevier.com/locate/rmcr

Case report

Giant cell carcinoma of the lung successfully treated with surgical resection and adjuvant vinorelbine and cisplatin

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ABSTRACT

Giant Cell Carcinoma of the lung, a subtype of Sarcomatoid lung cancer is a poorly differentiated Non-Small-Cell Lung Cancer. GCCL has exceptionally aggressive characteristics, and its prognosis is much poorer than any other NSCLCs. Herein, we present a rare case of Giant Cell Carcinoma of lung treated successfully with surgical resection and adjuvant vinorelbine and cisplatin.

A 48-year-old African American man with a history of smoking and chronic obstructive pulmonary disease was admitted to the hospital for chief complaints of shortness of breath. He was found to have a 3.5 cm × 3.3 cm x 2.8 cm cavitary right upper lobe mass which turned out to be poorly differentiated Giant Cell Carcinoma with extensive necrosis and deemed similar to stage 1b non-small cell lung cancer. He was successfully treated with right upper lobectomy and adjuvant chemotherapy with vinorelbine and cisplatin. He was followed for seven years with no evidence of recurrent disease.

Giant Cell Carcinoma's existing literature is limited, and hence our case is reportable. Our case is unique because of the better outcome which we believe might be the result of early detection and treatment with surgical resection along with adjuvant chemotherapy. More studies are needed to deeply understand the need for adjuvant chemotherapy in stage 1 b GCCL, and proper guidelines are required for the indications of adjuvant chemotherapy in Stage 1b GCCL.

1. Introduction

Lung cancer is still the leading cause of cancer-related deaths, accounting for 1.4 million deaths worldwide [1] and approximately 160,000 deaths in the United States every year [1] with increasing incidence worldwide [2]. Giant cell carcinoma of the lung (GCCL) is a rare variant of non-small cell lung carcinoma (NSCLC), accounting for 0.1–0.4% of all lung cancers [3]. It is clinically aggressive with inadequate response to antitumor chemotherapy, resulting in a very poor prognosis [4]. Herein, we present a rare case of Giant Cell Carcinoma of lung treated successfully with surgical resection and adjuvant vinorelbine and cisplatin.

1.1. Case presentation

Seven years ago, a 48-year-old African American man was admitted to the hospital for concerns of shortness of breath and anxiety. Medical history was significant for 15-pack-year smoking history, Chronic Obstructive Pulmonary Disease, anxiety, and osteoarthritis. On imaging, chest x-ray showed an opacity in the right upper lobe. Subsequent imaging of chest showed the presence of 3.5 cm × 3.3 cm x 2.8 cm cavitary right upper lobe mass with maximum SUV 5.0. He underwent a bone scan which showed multiple foci of increased uptake through the ribs and an intense focus in the right scapula which were non-FDG avid on Positron emission tomography. The patient denied any family history of lung cancer.

A biopsy of the right lung mass was done which showed giant cell carcinoma, poorly differentiated with extensive necrosis. The tumor stage was T2N0Mx, equal to stage 1b non-small cell lung cancer. Subsequently, the patient underwent right upper lobectomy with mediastinal lymph node dissection and received four cycles of adjuvant chemotherapy with vinorelbine and cisplatin. Eventually, the patient quit smoking and was successfully treated with no evidence of recurrence on further imaging and follow up.

The patient was followed for seven years, and on imaging, multiple stable rib lesions and right scapular bone lesions were seen. Subsequent imaging with Computed Tomography of the chest showed no evidence of parenchymal mass (Figs. 1 and 2). A biopsy of the rib lesion was deferred by interventional radiology due to low yield and the risk of causing pneumothorax. The oncology team concluded that the rib lesions and right scapular lesion were not of malignant etiology. Future Computed tomography and Positron emission tomography scans were negative for lymph nodes or any other organ involvement. He did well so far, showing no local recurrence or distal disease in a 7-year follow-

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https://doi.org/10.1016/j.rmcr.2018.10.012
Received 13 September 2018; Received in revised form 10 October 2018; Accepted 12 October 2018

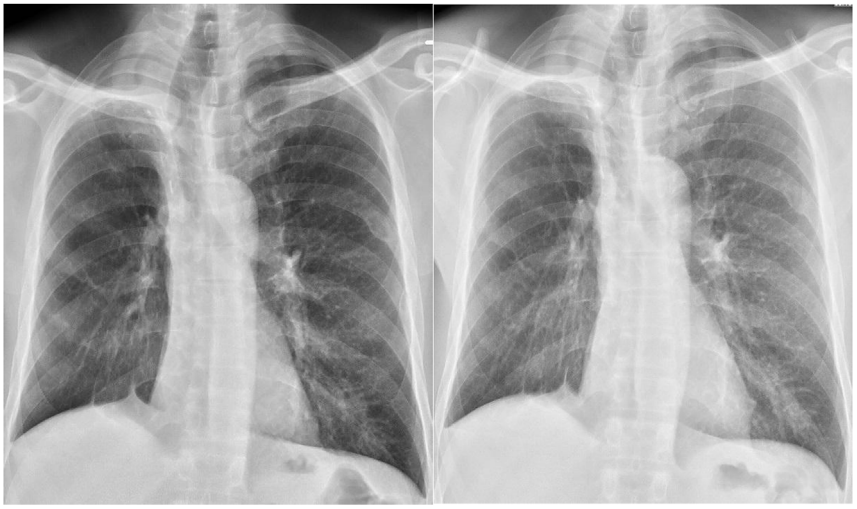

Fig. 1. Chest x-ray obtained two years and seven years after surgical resection of the right upper lobe showing no evidence of recurrence.

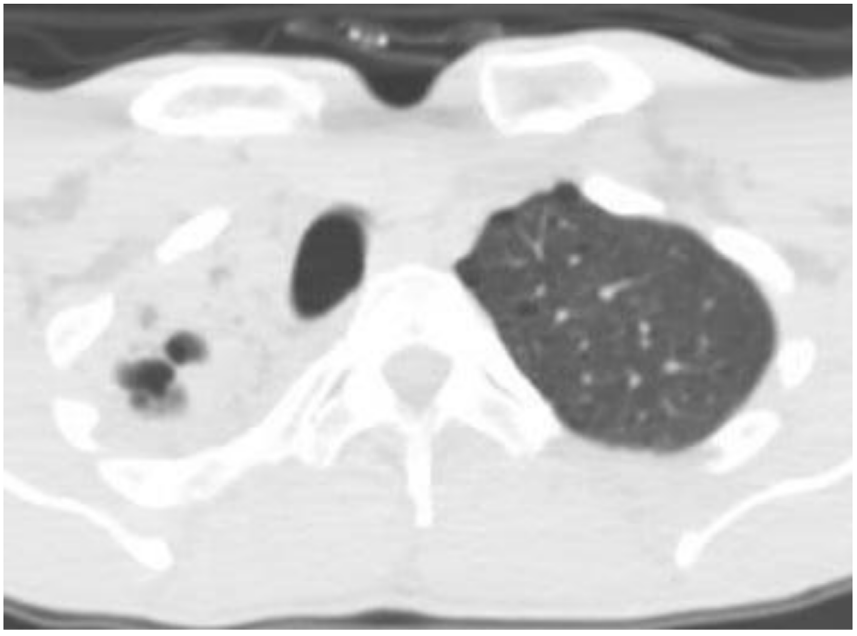

Fig. 2. Computer Tomography of chest post right upper lobe resection.

up period.

2. Discussion

Giant Cell Carcinoma of the lung's existing literature is limited, and the current NSCLC's general literature guides the current management. Our patient's Giant Cell Carcinoma of lung was treated successfully with surgical resection and adjuvant vinorelbine and cisplatin. Giant cell carcinoma of the lung was first discovered and named by Nash and Stout in 1958 [5]. Giant Cell Carcinoma has been categorized by the World Health Organization as a sarcomatoid carcinoma [3], along with other subtypes, including pleomorphic carcinoma, spindle cell carcinoma, carcinosarcoma, and pulmonary blastoma [3]. GCCL is different from Large Cell Carcinoma of the lung which is also a subtype of NSCLC [6]. GCCL is associated with smoking, and it is more commonly seen in males [5]. GCCL can occur in any lung lobe, but it is more commonly found in the upper lobes [7]. GCCL may be asymptomatic like other NSCLCs, or patients may complain of non-specific signs and symptoms like cough or hemoptysis [7]. GCCL is a poorly differentiated tumor with early metastasis to the brain, bone, adrenal gland, and liver, through lymph and blood circulation. Uncommon metastasis to the gastrointestinal tract, kidney, and heart has also been reported [7].

The majority of patients with suspected lung cancer require tissue biopsy to confirm the diagnosis [8]. GCCL is easily distinguished from other forms of lung cancers by histopathology [3]. Under the microscope, GCCL tumor cells are big, multi-core, bizarre with plenty of neutrophils and lymphocytes in the background [7]. A characteristic feature of GCCL is emperipolesis, which is the presence of collections of polymorphonuclear leukocytes within the giant cells, apparently phagocytosing cytoplasmic contents [7].

Surgical resection is an effective treatment and provides adequate control for limited-stage GCCL [7]. Patients with NSCLC are at substantial risk for recurrence and death even after complete surgical resection [9]. The role of adjuvant chemotherapy for patients with resected stage IB disease is controversial [2]. However, in general chemotherapy is offered to medically appropriate patients with stage IB disease whose tumors display one or more high-risk features, including lymphovascular invasion, poor differentiation, high standardized

uptake value (SUV) on positron emission tomography (PET; variably defined as SUV 10 or more). In our patient, adjuvant therapy with cisplatin and vinorelbine was preferred due to the presence of a poorly differentiated tumor. Adjuvant chemotherapy in stage IB disease with tumor size > 4 cm may also improve survival [2]. The primary goal of adjuvant therapy is to eradicate micrometastases, decreasing the rate of distant metastases and, thereby, increasing survival following resection [2]. In patients with stages IIA, IIB, and IIIA after complete resection, adjuvant cisplatin-based chemotherapy has become a standard of care [2]. Adjuvant cisplatin-based doublet therapy, preferably with vinorelbine is recommended currently and has been documented to show the longest survival [2]. The efficacy of radiotherapy in the treatment of GCCL has not been identified yet [7].

In an assessment of a small number of NSCLC patients with epidermal growth factor receptor (EGFR) mutations and anaplastic lymphoma kinase (ALK) inversions/translocations, EGFR tyrosine kinase inhibitors were effective in GCCL patients with EGFR mutations [4], but the information about these mutations in GCCL is limited [4]. In GCCL patients with positive expression of PD-L1, Pembrolizumab (anti-PDL1 antibody) has been reported to be effective [4], although the data on PD-L1 expression in GCCL is limited [4]. When compared with other NSCLCs, GCCL has a poor prognosis with median survival reported to be around 8–10 months [10]. Local or regional recurrence in stage I NSCLC after surgical resection has been reported to be between 7% and 15% [11] and hence the role of adjuvant chemotherapy in stage 1b GCCL specifically should be investigated.

In conclusion, Giant Cell Carcinoma's existing literature is limited, and hence our case is reportable. Giant Cell carcinoma of lung is a rare disease with aggressive characteristics. It has a poor response to chemotherapy, resulting in a poor prognosis. Our case is unique because of the better outcome which we believe might be the result of early detection and treatment with surgical resection along with adjuvant chemotherapy. This case emphasizes the role of adjuvant chemotherapy in stage IB disease. However, proper guidelines are needed for the indications of adjuvant chemotherapy in Stage 1b GCCL.

Disclosure statement

No potential conflict of interest was reported by the authors. No funding was received.

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