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Case report

Nab-paclitaxel plus carboplatin as an effective and safe chemotherapy regimen for pulmonary carcinosarcoma with interstitial lung disease: A case report

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ABSTRACT

Carcinosarcoma is a rare histological type of non-small cell carcinoma (NSCLC), and its prognosis has been reported to be worse compared with other NSCLCs. Nanoparticle albumin-bound paclitaxel (nab-PTX) + carboplatin (CBDCA) achieves a favorable response rate in patients with non-small cell lung cancer (NSCLC). We administered nab-PTX + CBDCA to a 68-year-old man with postoperative recurrent carcinosarcoma with interstitial lung disease (ILD). A partial response was evident after four cycles of chemotherapy. To the best of our knowledge, the present study is the first to report the safety and efficacy of nab-PTX + CBDCA for treating carcinosarcoma with ILD.

1. Introduction

It has been reported that carcinomas with a histological sarcomatous component is rare and more aggressive than other types of lung cancer. In 2015, the World Health Organization classified carcinomas with a sarcomatous-like component with a spindle cell or giant cell appearance, or those associated with an occasional heterogeneous sarcomatous component, as sarcomatoid carcinomas. There are five subtypes: pleomorphic carcinoma, spindle cell carcinoma, giant cell carcinoma, carcinosarcoma and pulmonary blastoma [1]. Sarcomatoid carcinomas may arise in the lung where they account for approximately 0.4% of non-small cell lung cancers (NSCLCs) [2]. Carcinosarcoma, a subtype of sarcomatoid carcimomas, was first defined by Kita et al., in 1908 as a poorly differentiated non-small cell lung carcinoma containing a component with sarcoma or sarcoma-like features [3].

Prognosis is poor for patients with sarcomatoid carcinoma, including those with carcinosarcoma, compared with other NSCLCs because of the high rate of resistance to conventional first-line chemotherapy [4]. Chemotherapy for lung cancer occasionally exacerbates preexisting interstitial lung disease (ILD), especially idiopathic pulmonary fibrosis (IPF), which can be fatal [5]. Several studies report that the efficacy and safety of paclitaxel (PTX) and carboplatin (CBDCA) doublet chemotherapy is a suitable regimen for patients with NSCLC with ILD or IPF [6–9]. Nanoparticle (130-nm) albumin-bound paclitaxel (nab-PTX) exhibits higher activity and causes reduced toxicity compared with PTX. A phase 3 study found that administration of nab-PTX achieved a higher overall response rate and less neuropathy [10].

To our knowledge, there are no studies that address the use of this regimen for treating sarcomatoid carcinomas, particularly pulmonary carcinosarcoma with ILD. Here we describe a patient with pulmonary carcinosarcoma with ILD who responded to first-line treatment with nab-PTX + CBDCA without experiencing adverse effects within 28 days after last administration of chemotherapy.

2. Case report

A 68-year-old man, a former smoker (27 pack years), was admitted to another hospital in September 2016 for treatment following X-ray imaging detection of an abnormal shadow during a regular health examination. Computed tomography (CT) revealed a 72-mm irregularity in the upper-left lobe with typical interstitial pneumonia in the inferior lobes (Fig. 1). The patient underwent left upper lobectomy, and histopathology showed diffuse proliferation of pleomorphic tumor cells, including spindle-shaped and giant cells in the stroma, and tubular

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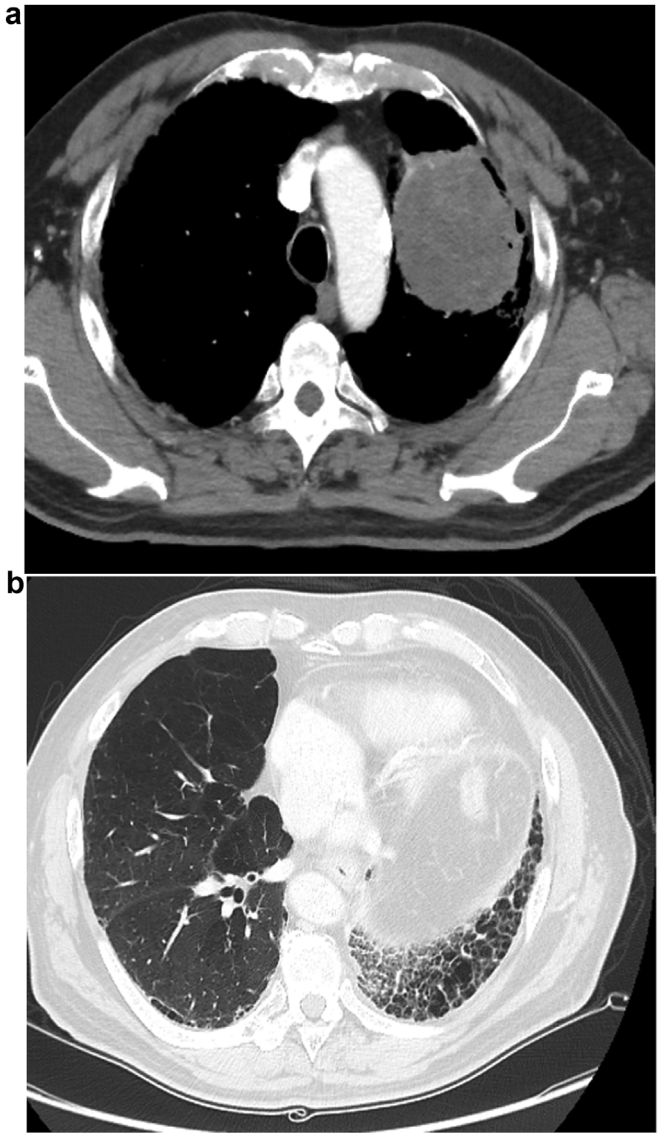

Fig. 1. Chest computed tomography (CT) before lobectomy. It revealed a 72-mm irregularity in the upper-left lobe (A) with typical interstitial pneumonia in the inferior lobes (B).

formation of columnar atypical cells. Immunohistochemical analysis demonstrated that the columnar tumor cells of the tubular component were diffusely positive for cytokeratin AE1/AE3, and partially positive for vimentin. Stromal spindle and giant cells are diffusely positive for vimentin and negative for AE1/AE3. Stromal component does not show specific differentiation such as bone, cartilage nor musculus (see Fig. 2). We considered the tumor consists of adenocarcinoma as the epithelial component, and sarcoma as the mesenchymal component. The patient was diagnosed with carcinosarcoma of the lung, which met the World Health Organization criteria [1]. Two months later, the patient was admitted to our hospital with paralysis of his left arm and leg. Head magnetic resonance imaging showed a brain tumor on right brain hemisphere (Fig. 3). We suspected metastasis of the lung cancer to the right parietal lobe of the cerebrum. The tumor was excised, and histopathology revealed that the tumor cells in the brain were similar to those of the left lung (consisting of epithelial and mesenchymal component, and positive for AE1/AE3 and vimentin, respectively) (Fig. 4).

The patient was diagnosed with pathological T4N1M0 stage IIIA lung carcinosarcoma with no driver mutation, such as EGFR mutation.

We therefore diagnosed distant recurrence of the lung carcinosarcoma. Moreover, chest CT scans detected new lesions in his right

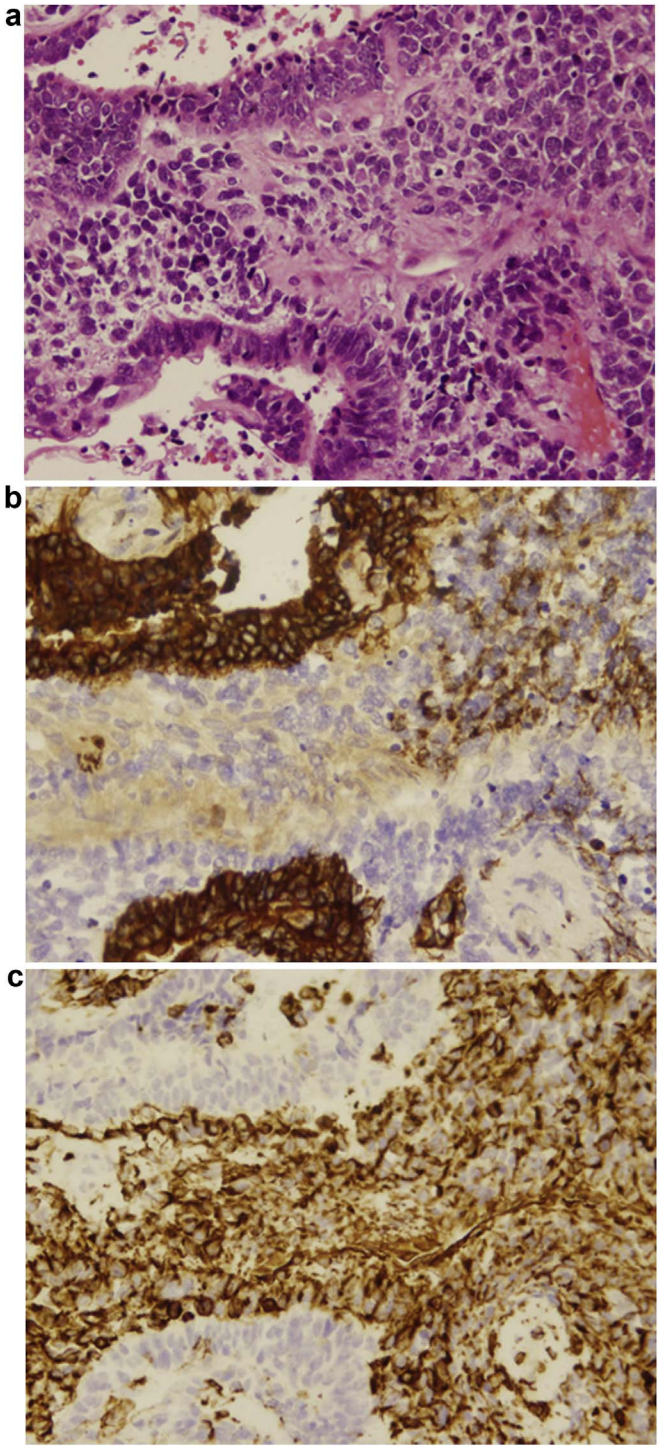

Fig. 2. Histopathological findings obtained from left upper lobectomy. An image of a hematoxylin and eosin-stained section showing the tumor diffuse proliferation of pleomorphic tumor cells. (A) (magnification, ×100) Immunohistochemical analysis showed positive for cytokeratin AE1/AE3 in the epithelial component (B) (magnification, ×100) and vimentin in the stromal component. (C) (magnification, ×100).

lung and mediastinal lymph nodes (Fig. 5 (A)). After surgery to remove the metastatic tumor from the brain, the patient's performance status improved after one week. He was lucid and walked unattended, although he was short of breath. We evaluated his performance status as 1. The patient's organ function was within normal range except for coincidence of ILD; therefore, we recommended him a first line chemotherapy regimen comprising nab-PTX (100 mg/m2) + CBDCA, area under the curve = 6, every 4 weeks. CT scans of the chest after four