Carboplatin plus Paclitaxel in the Successful Treatment of Advanced Inflammatory Myofibroblastic Tumor

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Abstract

A 26-year-old man with unresectable inflammatory myofibroblastic tumor (IMT) presented with multiple metastases in the thoracic vertebra and lymph nodes as detected by positron emission tomography (PET) received chemotherapy with carboplatin plus paclitaxel. After three cycles of chemotherapy, fluorine-18-fluorodeoxyglucose (FDG)-PET/CT revealed tumor regression and significant reduction of FDG uptake in all lesions. The patient received six cycles of chemotherapy without any severe adverse event, and there was no sign of disease progression for seven months. This regimen is well tolerated and may be considered the treatment of choice for unresectable IMT.

Key words: inflammatory myofibroblastic tumor, chemotherapy, carboplatin, paclitaxel

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Introduction

Inflammatory myofibroblastic tumor (IMT) is an unusual tumor that occurs primarily during the first two decades of life and affects multiple anatomic locations including soft tissues, lung, bladder, spleen, breast, colon, and soft tissue (1-6). A variety of terms have been used to describe this entity, including inflammatory pseudotumor, pseudosarcomatous myofibroblastic proliferation, and plasma cell granuloma. Although IMT has been classified as a benign tumor, it can be locally invasive and tends to recur (7). Given its neoplastic potential, complete resection is considered the mainstay of treatment for IMT, which affords a high probability of cure. However, when multiple metastases or aggressive local invasion makes complete resection unfeasible, alternative treatments including chemotherapy become necessary (8). We herein report a case in which a 26-year-old man with IMT was successfully treated by chemotherapy with carboplatin plus paclitaxel.

Case Report

A 26-year-old man with chronic nonproductive cough was referred to our hospital with a huge left mediastinal mass 7 cm in maximal diameter and pleural effusion on chest com-

Figure 1. A biopsy sample of inflammatory myofibroblastic tumor (IMT) showed proliferation of spindle cells with inflammatory infiltration containing histiocytes, lymphocytes and plasma cells.

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Figure 2. (A) New multiple metastatic lymph nodes including bilateral hilar lymph nodes (arrows) were found after the three-month steroid therapy. (B) CT after two cycles of chemotherapy showed regression of metastatic lymph nodes. PET/CT images obtained before (C, D) and after (E, F) three cycles of chemotherapy showed almost complete abolishment of the activity in IMT.

Computed tomography (CT). CT-guided biopsy of the mediastinal tumor was performed, and the diagnosis of IMT was pathologically confirmed (Fig. 1). Immunohistochemical analysis of anaplastic lymphoma kinase (ALK) was negative and fluorescence in situ hybridization (FISH) study detected no ALK gene rearrangement (data not shown). As positron emission tomography (PET)/CT revealed multiple metastases in lymph nodes and the thoracic vertebra, complete resection was deemed unfeasible.

At first, the patient was treated with corticosteroid, 1 g of methylprednisolone for three days, followed by maintenance therapy with prednisone. During the steroid therapy, the mediastinal tumor partially regressed, and the pleural effusion disappeared. Three months later, however, PET/CT revealed multiple new metastatic lymph nodes (Fig. 2A, C, D).

Subsequently, the patient received combination chemotherapy with triweekly carboplatin (area under the blood concentration time curve (AUC) =6, day 1) and paclitaxel (200 mg/m², day 1). After two cycles of chemotherapy, CT showed regression of the primary lesion and metastatic lymph nodes (Fig. 2B). After three cycles of chemotherapy, fluorine-18-fluorodeoxyglucose (FDG)-PET revealed significant reduction of FDG uptake in all lesions, showing a complete response (Fig. 2E, F). A total of six cycles of chemotherapy was administered without dose reduction. Although the patient developed grade 3 neutropenia and grade 2 peripheral neuropathy, he tolerated chemotherapy well and completed six cycles with no signs of disease progression.

Three months post-treatment, follow-up CT revealed primary lesion growth and recurrent lymph node metastases. However, the patient showed no radiological evidence of tumor progression or recurrence for seven months.

Discussion

IMT is a rare entity that mainly affects children and young adults and arises in various sites (7). According to the most recent World Health Organization classification, IMT is classified as a tumor of intermediate biological potential (9, 10). Some show malignant biological behaviors, with a tendency for local recurrence and a risk of developing distant metastasis in <5% of all cases (10). Molecularly, approximately 50% of IMTs show ALK gene rearrangement (11). Recent studies have suggested that ALK-positive tumors have a less aggressive clinical course with a very low risk of metastasis (12). Furthermore, some reports have described the efficacy of ALK inhibitor crizotinib in ALK-translocated IMT (13). In the present case, FISH analysis detected no ALK gene rearrangement, and the patient had an aggressive clinical course with multiple metastases.

In general, complete surgical resection is the curative therapeutic approach for IMT. Other treatment options include treatment with non-steroidal anti-inflammatory drugs, steroid therapy, radiation therapy, and chemotherapy (8, 14). In the present case, surgical resection was deemed not feasible due to multiple metastases, and the treatment with non-steroidal anti-inflammatory drugs and corticosteroid failed in short-term; therefore, we administered chemotherapy.

There is still little evidence regarding chemotherapy for patients with IMT. The data obtained thus far mainly concern the pediatric population (15) and no standard regimen for adult IMT has been established. Various active regimens have been reported, such as methotrexate plus vinorelbine, vincristine plus etoposide, cisplatin/carboplatin-based regimens, and ifosfamide-based regimens (8, 10, 16, 17), how-
ever these are mostly old drugs. Under such circumstances, the effectiveness of chemotherapy for IMT remains unclear, and a more tolerable chemotherapy regimen is considered adequate. Accordingly we chose carboplatin-paclitaxel regimen, which has been used as a standard chemotherapy in cancers of the lung and ovary, with the favorable tolerability well documented in previous reports (18, 19).

The present patient underwent six cycles of chemotherapy with no serious adverse events or dose reduction. The tumor response to chemotherapy was clearly demonstrated by PET/CT that showed initial tumor shrinkage and marked reduction of FDG uptake. The 3-week interval between chemotherapy and PET scan was considered adequate for the evaluation of response to chemotherapy (20).

This is the first report of IMT treated with several cycles of chemotherapy with carboplatin plus paclitaxel. Furthermore, our case suggests the effectiveness of the regimen and its favorable tolerability in the treatment of advanced IMT, although the 7-month progression-free period might not have been long enough. Further accumulation of evidence is required to establish this chemotherapy regimen in patients with aggressive or advanced IMT.

The authors state that they have no Conflict of Interest (COI).

References


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