Case Report

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Efficacy of Docetaxel as a Second-Line Chemotherapy for Thymic Carcinoma

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Key Words
Thymic carcinoma · Docetaxel · Second-line chemotherapy

Abstract
Thymic carcinoma is a rare and aggressive tumor, and the efficacy of second-line chemotherapy is still unclear. Here, we reported a case of thymic carcinoma that responded well to the administration of docetaxel alone as a second-line chemotherapy. A 64-year-old woman was diagnosed with thymic carcinoma (squamous cell type) with bone metastasis, and she, therefore, received nedaplatin combined with etoposide and ifosfamide. She responded partially, after which she received irradiation for bone metastasis. Two months after chemotherapy, the thymic carcinoma exhibited gradual regrowth and she experienced shoulder pain. We treated this with docetaxel alone (60 mg/m^2 every 4 weeks). After three courses of docetaxel, we observed a partial response and her shoulder pain disappeared. This case demonstrated that docetaxel is effective as a second-line chemotherapy for thymic carcinoma.

Introduction

Thymic carcinoma is a rare neoplasm arising from thymic epithelial cells. Compared to thymoma, the prognosis of thymic carcinoma is poor because this cancer frequently shows local invasion and/or distant metastasis at the time of diagnosis [1, 2]. Therefore, a combined modality including chemotherapy is necessary for the treatment of thymic carcinoma. Previously the effectiveness of combined chemotherapy as a front-line treatment has been demonstrated [3], but there are few reports describing a second-line chemotherapy for thymic carcinoma. Here, we report a case of thymic carcinoma that showed a good response to the administration of docetaxel alone as a second-line chemotherapy.

Case Report

A 64-year-old female was admitted to our hospital with hoarseness and dysphasia. A chest roentgenogram revealed a tumor on the mediastinum. Conventional chest computed tomography (CT) showed a left anterior mediastinal tumor, 64 × 46 mm in size, extending to the ascending aorta, brachiocephalic trunk, left general carotid artery, left subclavian artery, and left supraclavicular fossa (fig. 1). A hematological examination showed that the level of cytokeratin 19 fragment (CYFRA) was very high (96.2 ng/ml; normally <2.3 ng/ml). We performed a CT-guided biopsy, which revealed

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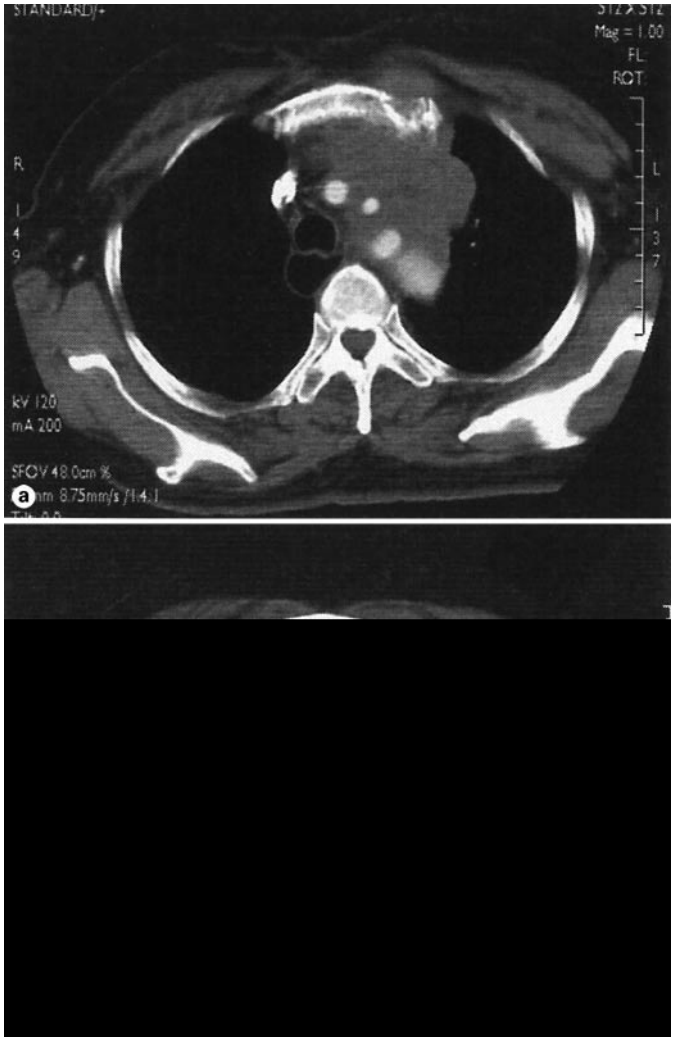

Fig. 1. a CT scan showing an anterior mediastinal tumor (64 × 46 mm), extending to the ascending aorta, brachiocephalic trunk, left general carotid artery, left subclavian artery, and left supraclavicular fossa. **b** CT scan showing a residual anterior mediastinal tumor.

squamous cell carcinoma (fig. 2). A bone scintigram revealed metastases to the third and fourth body of cervical vertebrae. The findings of a bronchoscopy were normal. Head CT and abdominal CT did not reveal another primary site, and hence we diagnosed a stage IVb thymic carcinoma according to the Masaoka staging system [4]. Because the patient had slight renal dysfunction, we used nedaplatin (70 mg/m^2 on day 1) combined with etoposide (100 mg/m^2 on days 1–3) and ifosfamide (1 mg/m^2 on days 1–3) every 4 weeks. The patient was treated with five courses of chemotherapy and radiotherapy to the bone metastases and obtained a partial response (fig. 1) with CYFRA reduced to 1.1 ng/ml.

Two months after the final administration of chemotherapy, she experienced shoulder pain and the rapid enlargement of a tumor in the anterior chest wall. A chest roentgenogram and CT revealed the recurrence and local invasion of thymic carcinoma projecting into the anterior chest wall (fig. 3), and CYFRA had increased to 90.3 ng/ml. She was readmitted to our hospital and given docetaxel alone (60 mg/m^2) via a 1-hour infusion every 4 weeks. After three courses the thymic carcinoma was markedly reduced, and the tumor that had projected into the anterior chest wall had virtually disappeared (fig. 3). We considered this a partial response, and CYFRA was reduced to 7.3 ng/ml. We found grade 3 neutropenia and anemia during the docetaxel treatment, but nonhematological toxicities were generally mild. Four months after the final administration of docetaxel, the tumor was enlarged again in the anterior chest wall.

Fig. 2. Photomicrograph showing squamous cell carcinoma. HE staining.

Discussion

Patients with progressive thymic carcinoma or who fail to respond to front-line chemotherapy are generally young and in otherwise good health, and, therefore, require further treatment. The aims of second-line chemotherapy should be both palliation and improvement of survival.

The efficacy of combined chemotherapy as a front-line treatment has been shown in patients with thymic carcinoma [3]. Kitami et al. [5] reported that modified ADOC therapy (Adriamycin, nedaplatin, cyclophosphamide, and vincristine) is effective against thymic carcinoma. Loehrer et al. [6] reported that a combined etoposide, ifosfamide and cisplatin regimen exhibits moderate activity against thymic carcinoma. Despite these recent reports showing the effectiveness of platinum-based combination

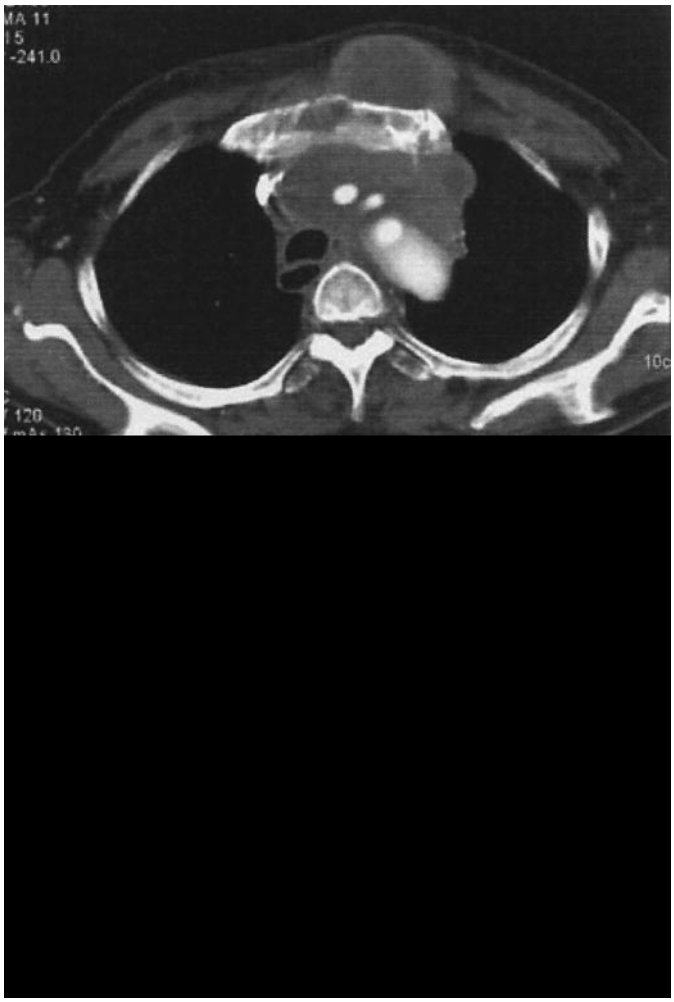

Fig. 3. a CT scan showing the recurrence and local invasion of a tumor that was projecting into the anterior chest wall. **b** CT scan showing a residual anterior mediastinal tumor and the virtual disappearance of this tumor.

chemotherapy, it is necessary to establish a more effective regimen for thymic carcinoma.

In contrast, there are few reports on second-line chemotherapies for thymic carcinoma. Recently, somatostatin analogs were shown to be effective in patients with advanced refractory thymic tumor, with the treatment generally being tolerated with acceptable toxicity [7]. The antiproliferative effects of somatostatin analogs have been reported in many tumor cell types; however, target somatostatin analog radiotherapy and chemotherapy require further investigation [8, 9].

Docetaxel, a semisynthetic taxane targeting the -subunit of tubulin, exhibits broad-spectrum anticancer activity. In clinical situations, this agent is used as front-line combination chemotherapy in ovarian, breast, and lung cancers. There is only one report showing the efficacy of docetaxel as combination chemotherapy for thymic carcinoma [10], and we found no reports of its use as a monotherapy. It was recently reported that monotherapy with docetaxel was superior to the best supportive care after a failure of platinum-based chemotherapy for non-small cell lung cancer, and that it resulted in improved survival and quality of life [11]. Furthermore, using docetaxel alone exhibited significant efficacy benefits over other recognized regimens in two large prospective, randomized trials involving patients with anthracycline-pretreated metastatic breast cancer [12, 13]. These results indicate the efficacy of docetaxel as a second-line chemotherapy for cancer treatment. We, therefore, employed single-agent administration of docetaxel as a second-line chemotherapy for platinum drug-pretreated thymic cancer. Our results suggest that docetaxel is a promising drug as a second-line chemotherapy for platinum drug-pretreated thymic cancer, but further studies are required to fully quantify the efficacy of this agent.

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