Successful Resection of Mediastinal Seminoma Evaluated the Response to Induction Chemotherapy with Fluorodeoxyglucose-Positron Emission Tomography

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Mediastinal seminoma is a rare malignant tumor, and the current strategy for primary mediastinal seminomas is making a prompt diagnosis and achieving an appropriate chemotherapy. However, consensus regarding the optimal post-chemotherapy management has not been reached. We experienced a case of 26-year-old man who was diagnosed mediastinal seminoma and evaluated the response to induction chemotherapy with fluorodeoxyglucose-positron emission tomography/computed tomography (FDG-PET/CT). Complete surgical excision of the tumor was performed. Pathologic findings of the surgical specimen showed no viable cells in the tumor.

Keywords: mediastinal tumor, Chemotherapy, positron emission tomography

Introduction

In recent years fluorodeoxyglucose-positron emission tomography (FDG-PET) has become popular in clinical practice and has been used for evaluation of response to cancer therapy. However, in mediastinal seminomas, reports of response to induction chemotherapy evaluated with FDG-PET/CT are very rare. We report a case of mediastinal seminoma showing abnormal uptake of FDG after chemotherapy and revealing no viable cells in the surgical specimen pathologically.

Case Report

A 26-year-old man without remarkable medical history was referred to our hospital for swelling of the left upper limb and face with chest oppression. Chest roentgenogram showed mediastinal enlargement (Fig. 1). Chest CT and fluorodeoxyglucose-positron emission tomography/computed tomography (FDG-PET/CT) revealed an anterior mediastinal tumor having high accumulation of FDG with standardized uptake value max (SUVmax) 9.00 (Fig. 2A and 2B). Abnormal biochemical findings were not detected serum level of and tumor markers such as CEA, CYFRA, Pro-GRP, AFP, and HCG-β were normal. Surgical partially excision of the tumor was performed under general anesthesia, and the pathological diagnosis was seminoma (Fig. 3A). His symptoms disappeared after one cycle of BEP chemotherapy consisting of bleomycin, etoposide, and cisplatin. After three cycles of BEP chemotherapy, the tumor size was reduced from 8.0 cm to 2.5 cm in diameter, however, abnormal uptake of FDG, SUVmax 2.73, was revealed by FDG-PET/CT (Fig. 2C and 2D). Consequently, we suspected that residual viable cells were present, and performed surgical excision of the tumor. We were ready to use cardiopulmonary pump in case an artificial vessel replacement was required due to a tumor invasion to aortic arch or branches of aorta. In a spine position, a standard
Fig. 1 Chest roentgenogram showing a mediastinal enlargement.

Fig. 2 A: Chest CT showing an anterior mediastinal tumor. B: PET revealed high accumulation of FDG; SUVmax 9.00, in the tumor. C: After three cycles of BEP chemotherapy, the tumor size was reduced from 8.0 cm to 2.5 cm in diameter. D: Abnormal uptake of FDG; SUVmax 2.73, in the residual tumor was revealed by PET.

PET: positron emission tomography; FDG: fluorodeoxyglucose

Fig. 3 A: Small mature lymphocytes and giant mononuclear cells were closely-aggregated. Immunostaining showing LCA (+), AE1/AE3 (+), c-kit (+), PAP (+), CD-30 (−) and AFP (−). From these findings, seminoma was diagnosed. B: The microscopic finding showed no viable cells, and calcified and fibrillation change was confirmed in the necrotic tumor. C: Resected tissues: weight 55 g size 10 × 7 × 2 cm. D: Lobulated necrotic yellow tumor (in size 4.5 × 3.5 × 1.7 cm) in the resected tissue.
median sternotomy was performed. The tumor densely adhering to the aortic arch and the branches was carefully dissected. The tumor could not be dissected from the junction of the left brachiopheal vein and superior vena cava. Therefore, we performed tangential resection of superior vena cava. Involved left brachiopheal vein was resected together with the tumor en block (Fig. 3C and 3D). The patient’s postoperative course was uneventful (Fig. 4). The pathological examination revealed no viable cells in the tumor (Fig. 3B). The patient had no recurrence 16 months after the operation.

Discussion

The current strategy for primary mediastinal seminomas is making a prompt diagnosis and achieving an appropriate chemotherapy. However, consensus regarding the optimal postchemotherapy management has not been reached. It is reported that patients with a residual mass greater than or equal to 3 cm after chemotherapy are indicated to resection.1) The other article recommended the close follow-up for the patient with a persistent radiographic mass after completion of induction chemotherapy, and a salvage treatment in case a relapse occurs.2) Recently, FDG-PET is used as an estimating device for viable residual lesions in seminoma patients after chemotherapy.3,4) In this patient, FDG-PET was performed before and after chemotherapy. Although the size of the tumor was reduced to less than 3 cm, abnormal uptake of FDG persisted. Accordingly, we performed a complete resection of the tumor. The pathological finding showed necrotic tumor and no viable cells. On the other hand, calcified and fibrillation change was confirmed in the necrotic tumor. Therefore, remaining level of SUVmax after chemotherapy is likely to reflect an inflammation lesion in repairing process after oncolysis. In the future, accumulating knowledge regarding FDG-PET in the mediastinal seminoma patients after chemotherapy will contribute to an optimal management of the residual tumor after chemotherapy.

References