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Successful treatment of limited-stage small-cell lung cancer in the right mainstem bronchus by a combination of chemotherapy and argon plasma coagulation

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ABSTRACT

The current standard-of-care treatment for patients with limited-stage small-cell lung cancer (SCLC) is concurrent chemoradiotherapy for local and systemic control. However, standard-of-care treatment strategies have not been established for those with limited-stage SCLC who have a history of thoracic radiotherapy due to concerns with complications associated with radiation overdose. A 37-year-old male developed an aspergilloma in the postoperative left thoracic space after he was treated with concurrent chemoradiotherapy for mediastinal type lung adenocarcinoma and subsequent left upper lobectomy for heterochronous dual adenocarcinoma. Fiberoptic bronchoscopy was performed to examine the status of the suspected bronchopleural fistula when a polypoid mass was observed in the right mainstem bronchus. A histological examination showed that the mass was SCLC at a clinical stage of cTisN0M0, stageIA, without local invasion. Since thoracic radiotherapy was not an option due to a previous history of thoracic irradiation, a combination treatment of carboplatin and etoposide was administered for 4 cycles and resulted in good partial response. In addition, argon plasma coagulation (APC) was performed as an alternative to curative radiotherapy on day 22 of the 4th cycle. The 5th cycle was administered 7 days after APC at which the anticancer therapy was completed. The patient remains disease-free 60 months after the completion of treatment, which suggests that this combination therapy may resolve very early-stage SCLC.

1. Introduction

Small-cell lung cancer (SCLC) possesses high malignant potential and aggressive clinical course that may spread to regional lymph nodes and distant organs during the early stages [1]. The current standard-of-care treatment for patients with limited-stage SCLC is concurrent chemoradiotherapy for local and systemic control [2,3]. However, there is currently no established strategy for patients with limited-stage SCLC who had previously received thoracic external beam radiation therapy (EBRT).

This report describes a patient with very early-stage SCLC in the right mainstem bronchus (cTisN0M0, stageIA) who had a previous history of thoracic EBRT and was successfully treated with a combination treatment of carboplatin and etoposide followed by argon plasma coagulation (APC). He remains disease-free for 60 months.

2. Case report

A 37-year-old male developed an aspergilloma in the postoperative left thoracic cavity after receiving concurrent chemoradiotherapy for mediastinal type lung adenocarcinoma and subsequent left upper lobectomy for heterochronous dual adenocarcinoma (Fig. 1A). Since the systemic administration of anti-fungal agents was ineffective, thoracic surgery was considered. When fiberoptic bronchoscopy (FOB) was performed, a polypoid lesion was observed in the right mainstem bronchus (Fig. 1B) that exhibited magenta in an autofluorescence image (Fig. 1C). Histological examination demonstrated that the mass was SCLC. Contrast-enhanced CT of the chest did not show the tumor, its invasion into the bronchial cartilage, or apparent metastases into the regional lymph nodes (Fig. 1D). Whole-body evaluation demonstrated no distant

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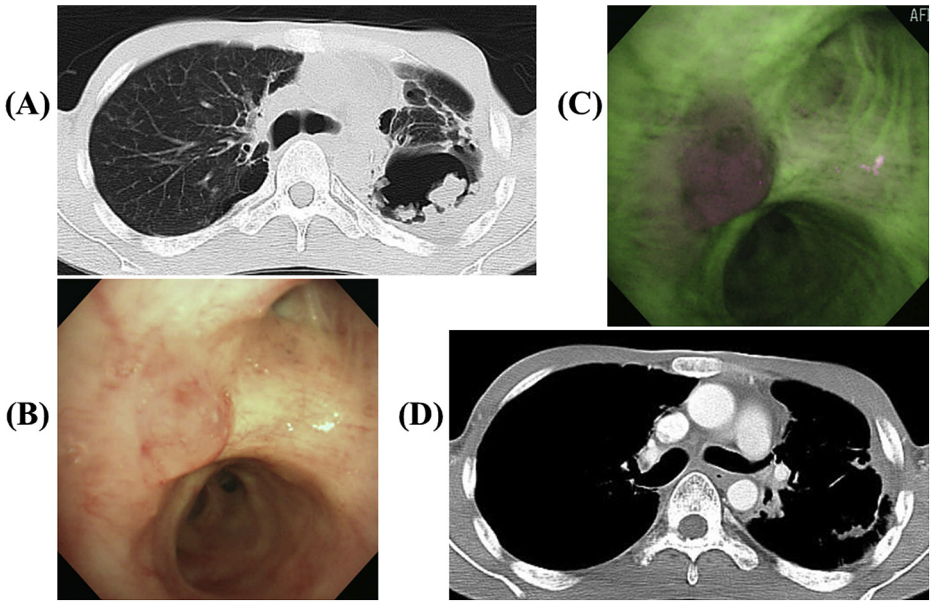

Fig. 1. Images of the chest CT (A, D) before the treatment showed an aspergilloma located in the left thoracic cavity (A). However, it was difficult to detect a mass in the right mainstem bronchus and marked lymph nodes swelling (A, D). Images from white-light (B) and autofluorescence (C) bronchoscopy demonstrated a polypoid lesion in the right mainstem bronchus that is shown in magenta in the autofluorescence image.

organ metastases. Although endobronchial ultrasound was not available, the macroscopic findings from FOB and contrast-enhanced CT of the chest suggested that the lesion was confined in the bronchial mucosa without local invasion. Therefore, the clinical stage was considered to be cTisN0M0, stageIA.

Since additional EBRT could not be administered due to a previous history of thoracic EBRT, a combination treatment of carboplatin and etoposide was administered. The tumor response was assessed by FOB after 2 cycles and showed good partial response. With the intention for complete cure, APC [4] was employed for local treatment on day 22 of the 4th cycle in order to have local control. An image from a FOB session on day 22 prior to APC is shown in Fig. 2A.

Under topical anesthesia, a fiberoptic bronchoscope was inserted and an axial probe tip was selected for APC. APC was performed using the following parameters: pulsed mode, effect 1, argon gas

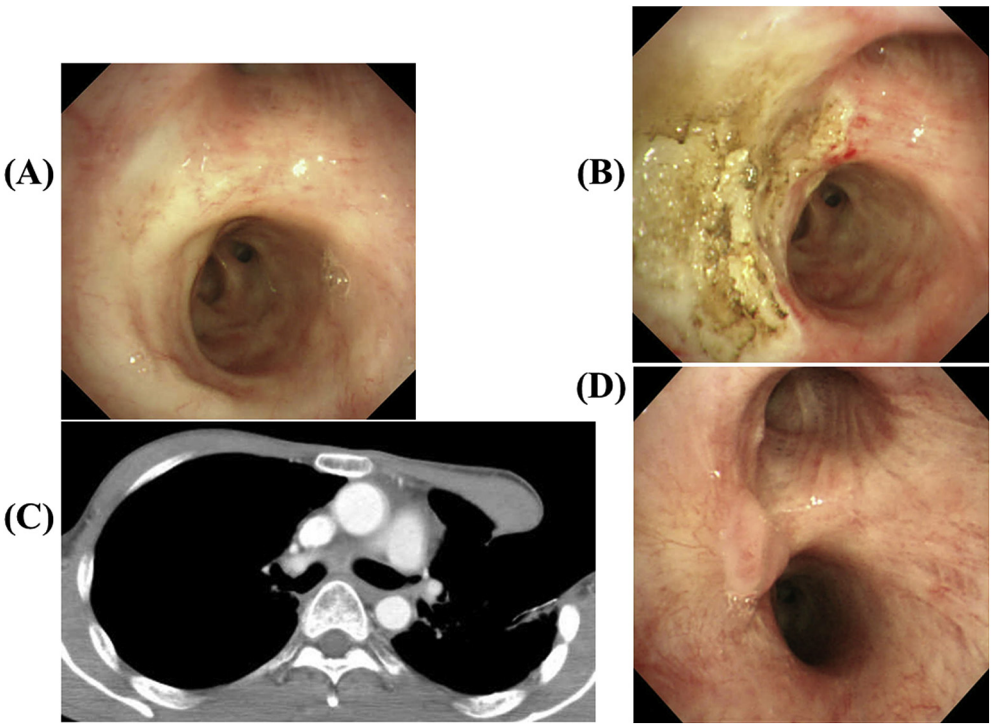

Fig. 2. Images of fiberoptic bronchoscopy (FOB) obtained on day 22 of the 4th cycle before (A) and after (B) treatment by argon plasma coagulation (APC) are shown. A scar-like lesion was observed (A), and APC was conducted by using appropriate settings (B). Images of chest CT (C) and FOB (D) obtained 24 months after the APC are shown. Chest CT showed the postoperative status of the left cavernostomy and no abnormalities in the right mainstem bronchus were found (C). A scar-like epithelial thickening was observed by white-light bronchoscopy (D).