Spontaneous pneumothorax after intensive chemotherapy in endometrial cancer: A rare complication

Jen-Ruei Chen a, b, *, Yuh-Cheng Yang a

a Division of Gynecologic Oncology, Department of Obstetrics and Gynecology, Mackay Memorial Hospital, Taipei, Taiwan
b Mackay Medicine, Nursing and Management College, Taipei, Taiwan

Abstract

Objective: Endometrial cancer with hematogenous metastases can be treated with chemotherapy. We present a case of spontaneous pneumothorax that occurred when a solitary pulmonary endometrial metastatic lesion was treated with paclitaxel plus carboplatin.

Case report: A 38-year-old female had stage II endometrial endometrioid adenocarcinoma. Solitary bilateral pulmonary metastases developed after primary treatment. Complete remission accompanied by a right spontaneous pneumothorax occurred during chemotherapy with paclitaxel plus carboplatin.

Conclusion: Rapid shrinkage of a pulmonary space-occupying tumor sometimes causes rare but life-threatening spontaneous pneumothoraces. We report the first case of a spontaneous pneumothorax after using paclitaxel plus carboplatin in the treatment of endometrial cancer.

Introduction

Chemotherapy plays a major role in treating endometrial cancer patients who develop hematogenous spread or disseminated metastases. Spontaneous pneumothoraces have been reported as one of the therapeutic comorbidities of rapid regression of pulmonary metastatic, space-occupying lesions after chemotherapy [1]. This condition is relatively common in osteogenic tumors or sarcomas, but is never reported in metastatic endometrial endometrioid adenocarcinoma in the world. A spontaneous pneumothorax developed in a patient with endometrial cancer after chemotherapy with paclitaxel and carboplatin (Bristol Myers Squibb, New York, USA) following the rapid regression of pulmonary metastatic lesions.

Case presentation

A 38-year-old woman (para 2) was diagnosed with poorly differentiated endometrial endometrioid adenocarcinoma after staging surgery. The International Federation of Gynecology and Obstetrics (FIGO) stage was II (myometrial invasion was near-whole thickness, combined with endocervical stromal invasion). Whole pelvic radiation therapy (total dose 5040 cGy) and intravaginal brachytherapy were completed within 2 months after surgery.

Unfortunately, solitary pulmonary metastases with bilateral multiple nodules developed 3 months after the patient completed radiation therapy. She declined a tissue biopsy. The primary surgical field was negative for recurrence. Salvage chemotherapy with cisplatin (50 mg/m²) plus doxorubicin (60 mg/m²; PA regimen) was arranged, and complete remission was achieved after the first three courses of the PA regimen. She received three additional courses of the PA regimen without any complications.

However, the pulmonary lesions relapsed rapidly 3 months after completing the previous chemotherapy. The metastatic sites expanded to not only the bilateral lung fields (Fig. 1), but also the mediastinum. The primary surgical field was negative for recurrence. The regimen was then changed to paclitaxel (175 mg/m²) plus carboplatin (AUC5; TC regimen). Significant radiographic improvement was observed after three courses of the TC regimen without any morbidity. She developed dyspnea, right chest tightness, and a dry cough after the fourth course of the TC regimen.

A right spontaneous pneumothorax was confirmed. In addition, all pulmonary metastatic nodules had almost disappeared in the imaging study (Fig. 2). An emergent chest tube was inserted for drainage and she recovered thereafter. An additional two courses of...
the TC regimen were administered as scheduled without any respiratory complications. Complete disease remission was again noted by imaging and tumor marker studies after six courses of the TC regimen were completed.

The third relapse was encountered 3 months after completing the sixth course of the TC regimen. Right scalene lymphadenopathy, which infiltrated the right jugular vein and the right brachial plexus, caused right facial swelling, right hand disability, and intractable neuralgia. Salvage chemotherapy of weekly paclitaxel (80 mg/m²) and palliative local radiation therapy had little effect. She died 28 months after the first course of the PA regimen.

Discussion

A spontaneous pneumothorax is classified as primary and secondary based on its etiology. The mechanism underlying primary spontaneous pneumothoraces is not fully understood. By contrast, secondary spontaneous pneumothoraces occur from a variety of diseases affecting the airways and parenchyma [2].

Malignancy, either primary lung malignancies or pulmonary metastatic tumors, is one of the causes of secondary spontaneous pneumothoraces. The most commonly reported cancer that causes secondary pneumothorax is metastatic lung sarcoma [3,4]; in addition, primary lung cancer [5], thyroid cancer [6], germ cell or sex cord tumor [7–9], breast cancer [10], renal cell carcinoma [11], and mediastinal lymphoma [12] have all been reported to cause secondary spontaneous pneumothoraces. This might be the first report of a secondary spontaneous pneumothorax caused by treating metastatic uterine endometrioid adenocarcinoma.

Several possible hypotheses of cancer treatment-related secondary pneumothoraces have been proposed. First, tumors destruct the broncho-alveolar tissue, capillaries, or pleura directly [2]. A second hypothesis involves the rapid shrinkage of space-occupying tumors caused by various treatment modalities, such as chemotherapy [5] or molecular targeted therapy [13]. Third, molecular-targeted therapeutic agents, especially gefitinib, block alveolar capillary growth and cause normal tissue damage [13]. In the case presented herein, a chemosensitive pulmonary metastatic malignancy may have rapidly shrunk after effective chemotherapy and caused a spontaneous pneumothorax.

Endometrial cancer is the third most common gynecologic malignancy in Taiwan. Advanced-stage endometrial cancer often develops hematogenous or distant metastases rapidly and easily after primary surgery and radiation therapy. Lung, liver, and bone are the most frequent metastatic sites. Only systemic chemotherapy plays a role when distant metastases occur, but the optimal regimen is still controversial. A combination of cisplatin and doxorubicin, or paclitaxel and carboplatin are effective in disease salvage and tolerable toxicity [14–16]. A triple combination of cisplatin, paclitaxel, and doxorubicin gives rise to a better response [15]. Not surprisingly, the toxicity is difficult to tolerate in previous heavily-treated cases.

In our case, we observed an excellent response to both our chemotherapeutic regimens (PA and TC regimens) in treating hematogenous metastatic endometrioid adenocarcinoma. The disease-free interval in our case was not as good as in serial cases studies [16]. An extremely rare complication of a spontaneous pneumothorax was encountered after dramatic tumor shrinkage during chemotherapy. We hypothesize that the disappearance of the pulmonary space-occupying metastatic lesion caused this rare comorbidity. Delayed diagnosis of a pneumothorax is serious and life-threatening. This might be the first case report of a spontaneous pneumothorax developing after the combination of paclitaxel and carboplatin for the treatment of metastatic endometrial cancer.

Fig. 1. Before chemotherapy with paclitaxel and carboplatin, imaging of bilateral lung fields demonstrated multiple, variable-sized metastatic nodules.

Fig. 2. The image depicts a right spontaneous pneumothorax with almost total regression of pulmonary nodules after four courses of chemotherapy with paclitaxel and carboplatin. White arrows indicate right lung marking.
In conclusion, we should be vigilant for any respiratory symptoms after chemotherapy with rapid pulmonary tumor shrinkage. Spontaneous pneumothorax is a rare but still possible condition that is sometimes life-threatening.

Conflicts of interest

The authors declare that they have no conflicts of interest.

References