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Successful one-stage operation for ipsilateral, synchronous carcinomas of the breast and lung : A case report

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Abstract:	The incidence of double primary malignancies is very low, particularly, a case of synchronous carcinomas of the ipsilateral breast and lung. Determining whether to have a one-stage operation for ipsilateral breast cancer and lung cancer is a challenge for the surgeon. The current study presents a case of a 56-year-old female, with a rigid textured mass measuring approximately 18×20 mm above the areola of the right breast and chest CT showing a mass of 20 × 14 mm at the tip segment of right upper lobe of the lung. A diagnosis of a synchronous dual primary carcinoma of the right lung (cT1N0M0) and right breast (cT1N0M0) was made. The patient underwent a right breast-conserving surgery, sentinel node biopsy, and right upper lobectomy and lymphadenectomy with a video-assisted thoracoscopic technique simultaneously. To our knowledge, in the previous literature, there was no one-stage operation for ipsilateral, synchronous carcinomas of the breast and lung and only one reported case with left breast and right lung cancer underwent a one-stage operation. This report first presents the successful treatment of a case with synchronous primary breast and lung carcinomas on the same side of the body with a one-stage operation and therefore is educational.

Successful one-stage operation for ipsilateral, synchronous carcinomas of the breast and lung：A case report

Abstract

The incidence of double primary malignancies is very low, particularly, a case of synchronous carcinomas of the ipsilateral breast and lung. Determining whether to have a one-stage operation for ipsilateral breast cancer and lung cancer is a challenge for the surgeon. The current study presents a case of a 56-year-old female, with a rigid textured mass measuring approximately 18×20 mm above the areola of the right breast and chest CT showing a mass of 20 × 14 mm at the tip segment of right upper lobe of the lung. A diagnosis of a synchronous dual primary carcinoma of the right lung (cT1N0M0) and right breast (cT1N0M0) was made. The patient underwent a right breast-conserving surgery, sentinel node biopsy, and right upper lobectomy and lymphadenectomy with a video-assisted thoracoscopic technique simultaneously. To our knowledge, in the previous literature, there was no one-stage operation for ipsilateral, synchronous carcinomas of the breast and lung and only one reported case with left breast and right lung cancer underwent a one-stage operation. This report first presents the successful treatment of a case with synchronous primary breast and lung carcinomas on the same side of the body with a one-stage operation and therefore is educational.

keywords: synchronous cancers; breast; lung; one-stage operation

Introduction

The incidence of double primary malignancies is very low, particularly, a case of synchronous carcinomas of the ipsilateral breast and lung [1-3] .Determining whether to have a one-stage operation for ipsilateral breast cancer and lung cancer is a challenge for the surgeon. This study first presented the successful treatment of a case with synchronous primary breast and lung carcinomas on the same side of the body with a one-stage operation. To our knowledge, in the previous literature, there was no one-stage operation for ipsilateral, synchronous carcinomas of the breast and lung and only one reported case with left breast and right lung cancer underwent a one-stage operation[4]and therefore is educational.

Case report

A 56-year-old female patient was admitted to the Department of Breast and Thyroid Surgery of Shaoxing People's Hospital three days after finding a lump over her right breast. She had reached postmenopause since 3 years ago and had exhibited no apparent problems and no history of smoking. On physical examination, a rigid textured mass measuring approximately 18 ×20 mm was found above the areola of the right breast. Chest CT showed a mass at the outer quadrant of the right breast (Fig.1). At the same time, CT also showed a mass of 20 × 14 mm at the tip segment of right upper lobe of the lung appeared with a lobulated edge and multiple small oval hypodense lesions in the center with mild enhancement under contrast-enhanced computed tomography. No significant mediastinal lymphadenopathy, no obvious signs of pleural effusion, and no obvious abnormalities were seen (Fig.1). The abdominal B-ultrasound, CT scan of head, and ECT bone scans showed no lesions. Immunohistochemistry (IHC) of core needle biopsy fom from the breast lump showed an infiltrating ductal carcinoma with grade II and positive ER, negative PR, negative Her-2 staining, and less than 3% positive Ki-67 staining. IHC of lung lesion sample showed an adenocarcinoma with positive TTF-1 and negative ER and PR staining. A diagnosis of a synchronous dual primary carcinoma of the right lung (cT1N0M0) and right breast (cT1N0M0) was made.

The patient underwent a right breast-conserving surgery, sentinel node biopsy, and right upper lobectomy and lymphadenectomy with a video-assisted thoracoscopic technique simultaneously. The order of surgery was the breast surgery at first and then lung surgery. The operation time was 4.5 hours with a total blood loss of 135 ml. Patient was woken and anesthesia intubation was removed 37 minutes after the surgery.

Post-operative recovery was uneventful. The examination of mastectomy specimen identified a tumor of 20 × 15 × 15 mm in size and histological examination showed infiltrating ductal carcinoma at grade II with 3 axillary sentinel lymph nodes negative. The examination of right upper lobectomy specimen identified a tumor of 22 × 20 × 16mm in size and histological examination showed adenocarcinoma with no invasion

of mediastinal pleura and negative bronchial margins. The dissection and pathological examination showed no malignancy in mediastianal lymph node stations. The patient received no chemotherapy, but Letrozol tablets were administered (2.5mg, qd) for adjuvant endocrine therapy and the patient received adjuvant radiotherapy at a dose of 45Gy for 25 fractions for the right breast cancer. The patient was followed up for 12 months and no signs of recurrence for lung cancer and breast cancer were observed (Fig.1).

Discussion

The occurrence of double primary malignancy is very low. A literature review of 1,104,269 cancer patients concluded a prevalence of double primary malignancies ranging from 0.73% to 11.7% [5]. Three criteria have been used for the diagnosis of double primary malignancies, which were fist established by Warren and Gates and refined later [6]: 1) Each of the tumors must be malignant as confirmed by histology; 2) Each lesion must be geographically separated by normal mucosa and distinct; and 3) Probability of one being the metastasis of the other must be excluded. Although the mechanisms responsible for the appearance of multiple primary cancers have not been fully elucidated, the most common risk factors include genetic susceptibility and intensive exposure to common environmental risk factors or carcinogens such as chemo- and/or radiotherapy for the treatment of first tumor [7].

Double primary malignancies can be divided into synchronous and metachronous double primary cancers depending on the interval between two diagnosis. Synchronous cancers are cancers where the second tumor occurred simultaneously or within 6 months of the diagnosis of the first malignancy, while metachronous double malignancies are secondary cancers occurring after 6 months from the diagnosis of the first malignancy. In clinical practice, most diagnosed double primary malignancies were metachronous. Arpacil et al reported that 81.6% of the 130 cases with double primary malignancy were metachronous tumors [7]. Bagri et al and Irimie et al also reported a similar rate[6,8].

The solitary pulmonary nodule is common in patients with breast cancer and is traditionally believed to be a metastasis. However, evidence indicates that a solitary

pulmonary nodule in a patient with breast cancer more likely represents a primary lung tumor that deserves more accurate evaluation for diagnosis and the appropriate treatment. Some population-based studies have suggested that patients diagnosed with primary breast carcinoma have a higher than expected incidence of primary lung cancer as well:Mellemkjaer et al reported that women who had primary breast cancer first had a 24% increase in the risk of developing primary lung cancer in comparison with women without primary breast cancer[2]. Raymond et alreported a similar increase in risk and believed that it may be associated with the radiotherapy for breast cancer[3]. Schonfeld et al reported that the incidence of secondary lung cancer was significantly elevated in ER^-, but not ER^+ breast cancer[9]. Although only a few of double primary malignancies of the breast and lung were reported, almost all reported cases were metachronous double cancer. Synchronous lung and breast cancer is rare. The reason may be that these two malignancies do not share predisposing etiologic or hereditary factors. In this case, the positive ER and PR expression in breast mass and positive TTF, negative ER and PR expression in lung mass confirmed the diagnosis of synchronous double primary cancers.

Treatment strategies for synchronous double malignancies depend on which malignancy is more advanced. The sequence of the treatment is often guided by aggressiveness of the first primary cancer. Generally, the more aggressive primary cancer will be treated first, although sometimes both cancers can be treated simultaneously. To our knowledge, only one reported case with left breast and right lung cancer underwent left modified radical mastectomy and right lobectomy with mediastinal nodal dissection with a video-assisted thoracoscopic technique at the same time [10]. Although resection of both neoplasms frequently offers the best chance of long-term survival, the risks and benefits of simultaneous surgery for each patient should be weighed against a staged surgery.

Ipsilateral breast cancer and lung cancer in an operation is a challenge for the surgeon. Because the traditional breast cancer surgery is the modified radical mastectomy. To perform this surgery, the skin should be free upper to the subclavian, down to the hypochondrium, inside to parasternal, and outside to the front edge of the

latissimus dorsi. However, conventional lobe or lung resection incision is also at the same area. The overlapping of two incisions may lead to contamination of tumor cells with each other and may cause iatrogenic metastasis. On the other hand, the bandaged chest after radical mastectomy is not conducive to the recovery of postoperative lung function. Therefore, most surgeons choose a staged surgery instead of one-stage operation for synchronous double breast and lung primary malignancies.

In this study, synchronous breast cancer and lung cancer were identified on the same side of the body and were successfully resected in a one-stage operation. Our patient underwent surgery for both primary tumors together not only because of the patient being in good general condition, but minimally invasive techniques contributed to this decision as well. Since 1998, video-assisted thoracic surgery has been used for pulmonary tumor treatment [11] . Since 2002, breast-conserving surgery, and since 2005, sentinel node biopsy have been used for breast cancer treatment[12,13]. The reduction in surgical trauma of breast and lung cancer makes completing two surgeries at the same time possible. Even for ipsilateral tumors, because of isolation of operative incision from each other (Fig.1), interaction contamination of tumor cells can be avoided. This patient underwent right breast conserving surgery plus sentinel lymph node biopsy and right lung resection with mediastinal nodal dissection using a video-assisted thoracoscopic technique. The patient's postoperative recovery was good and was discharged a week after surgery. To our knowledge, in the previous literature, there was no one-stage operation for ipsilateral, synchronous carcinomas of the breast and lung and only one reported case with left breast and right lung cancer underwent a one-stage operation[4].

In conclusion, we are first presenting an educational case report of a patient presenting with synchronous primary tumors with ipsilateral breast cancer and lung cancer who treated with a successful on-stage surgical approach.

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Figure legends

Figure 1. CT scan and incision. A) CT showing a mass at the outer quadrant of right breast. B) CT showing a mass at the tip segment of right upper lobe of lung. C) Incisions. 1: Incision for right upper lobectomy with a video-assisted thoracoscopic technique; 2：Incision for right breast-conserving surgery; 3：Incision for sentinel node biopsy.

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Figure

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