Breast Metastasis in Esophagus Cancer: Literature Review and Report on a Case

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Received 8 March 2016; Revised 2 May 2016; Accepted 11 May 2016

1. Introduction

Esophagus cancer metastases to unexpected sites usually happen when there are widespread metastases to other organs [1], and breast is considered one of the unexpected sites for esophageal cancer metastasis. Here, in order to understand more about this rare phenomenon, we conducted a literature review using Medline, PubMed, and Google Scholar on all the cases that described breast metastasis from esophageus cancer. We report as well a remarkable case with the largest breast metastasis from esophageus cancer.

2. Case Report

A 57-year-old woman presented to our clinic with a painful left breast mass (Figure 1). The mass started to appear six months previously and gradually increased in size to become painful and tense, but without discharge from the nipple.

Her past medical history revealed she had been diagnosed with esophageus carcinoma one year ago (Figure 2), but she had refused any kind of treatment back then. Review of her other symptoms showed that the dysphagia associating the esophageus cancer had increased gradually during the last year until it became impossible for her to swallow any solid food during the last month, and she had lost 25 kg during the previous four months.

The patient was severely malnourished, her BMI was 14 kg/m², and her vital signs were as follows: Bp: 100/55 mm/Hg; pulse: 130 beats per minute; temperature: 99.5 F; RR: 22 breath per minute; she was alert and oriented but looked tired. The examination showed a fixed 9 × 10 × 7 cm painful hard mass involving the left breast. The skin over the mass was red but not hot and the rest of the examination including the lymphatic system was unremarkable except a noticeable wheezing in the right chest.

The blood tests were normal except for a decrease in TP and ALB and a mild decrease in calcium. The head, chest, and abdominal CT scan showed a 4 × 6 × 7 cm lobulated mass involving the lower third of the esophageus accompanied with a large (10 × 9.5 × 8 cm) lobulated (with necrotic component) mass involving the left breast, the left chest muscles, and the pleura; this mass is compressing the anterior face of the lung and destroying the accompanied ribs (Figure 3); the CT scan showed as well left and right pleural effusions without any other obvious metastasis.

Review of her medical history revealed moderately differentiated squamous cell carcinoma of the mid-lower third of the esophageus. The breast biopsy showed solid cords, sheets, and lobules of pleomorphic malignant epithelial cells with occasional bizarre, hyperchromic nuclei with occasional keratin pearls compatible with poorly differentiated squamous cell carcinoma (Figures 4 and 5). The pleural effusion examination was negative for malignancy.
Feeding tube gastrostomy was done to the patient; however, she passed away two months later.

3. Discussion

In this study we did a literature review to the cases that described metastatic breast disease from esophagus cancer; we will report the clinical, radiological, and pathological features of the breast metastasis and we will review the diagnostic and the treatment options.

Only six cases were found in literature; besides our case the cases were 6 females and one male summarized in Table 1; the tumors were located in the middle and/or lower esophagus in 6 cases (squamous cell carcinoma (SSC) in five cases and adenocarcinoma in one case); only one case was reported as SCC in the upper middle part. These metastases were presented at variable times after the diagnosis of the original tumor (2 to 24 months); only one case reported the metastasis as the first sign of the esophagus cancer [2].

The physical examination of the breast metastasis demonstrated masses indistinguishable from primary mammary carcinoma, although they were often circumscribed and were described as painful in 3 cases. The metastasis size ranges
| Case | Study | Patient sex and age | Tumor location | Tumor pathology | Esophageal cancer treatment | The breast metastasis | Interval between tumor and metastasis | Metastasis management and outcome |
|------|-------|---------------------|----------------|-----------------|----------------------------|---------------------|-------------------------------------|----------------------------------|
| 1    | Nielsen et al., 1981 [2]. | 84 y/o female | Middle esophagus | Squamous cell carcinoma | No management available | 5 cm central mass located in the right breast | Three months after diagnosis | Breast metastasis detected at autopsy |
| 2    | Miyoshi et al., 1999 [3]. | 44 y/o male | Upper middle esophagus | Squamous cell carcinoma | Radiotherapy due to metastasis | Painful mobile hard mass beneath the left nipple | Two months after diagnosis | The patient died 2 months later. Autopsy: lung, liver, diaphragm, peritoneum, and spine metastasis |
| 3    | Shiraishi et al., 2001 [4]. | 57 y/o female | Middle esophagus | Squamous cell carcinoma | Esophagectomy Radiotherapy | 2.5 cm × 2.6 cm mobile painless hard mass in the upper outer quadrant of the left breast | Two years after surgery | The patient had modified radical mastectomy; she was alive 6 months later |
| 4    | Santeuksmia et al., 2006 [5]. | 51 y/o male | Middle esophagus | Squamous cell carcinoma | Esophagectomy Chemotherapy | 3 cm × 3 cm hard mobile nodule in the upper lateral quadrant of the left breast | Four months after surgery | Surgical resection of breast and brain relapse. Successful outcome II years later |
| 5    | Norooz et al., 2009 [6]. | 35 y/o female | Middle lower esophagus | Squamous cell carcinoma | Esophagectomy Chemotherapy Radiotherapy | 4 cm × 4.5 cm mobile, painful, hard mass just below the right nipple | Metastatic breast lesion was the first sign of the esophagus cancer | Resection of the breast mass. The patient has acceptable health condition 6 months after the treatment with no sign of recurrence |
| 6    | Jena et al., 2014 [7]. | 32 y/o male | Lower esophagus | Adenocarcinoma | Esophagogastrectomy Chemotherapy | 2 cm × 2 cm mobile hard lump in the upper outer quadrant of left breast | Two years after surgery | No management available; the patient died later |
| 7    | Our study 2016 | 57 y/o female | Middle lower esophagus | Squamous cell carcinoma | No management available | 10 cm × 9.3 cm painful hard mass involving the left breast | One year after diagnosis | The patient died 2 months later |
from 2 to 5 cm but it was remarkably larger in our case and reached 10 cm to completely involve the left breast, the left chest muscles, and the pleura. The metastases were located in the left breast in 5 cases and in the right breast in 2 cases.

The mammography was done in 5 cases and was negative for microcalcification. Core-needle or excisional biopsies were used for pathological diagnoses since immunohistochemistry and the presence of an in situ component play an important role in differentiating between primary and metastatic tumors [6]. Immunohistochemistry was always negative for ER, PR, and Her2 neu. In this review breast metastasis was the only recurrence in two cases, and acceptable results without signs of recurrence were mentioned up to six months after surgical resection of the breast metastasis. Only one case reported successful breast and brain metastasis resection outcome 11 years later. In our case, an autopsy was not done to the patient and she refused the treatment from the beginning; nevertheless, the large breast metastasis that involved the chest muscles and the pleura was the only detectable metastasis on CT scan. Three cases out of seven mentioned the presence of multiple untreatable metastasis during management or diagnosis.

We found that many case reports and some experimental studies were published trying to emphasize the complexity of esophagus cancer metastases patterns; these studies found that the complex anatomical pathway of the esophagus lymphatic network can elucidate the possibility of the random distribution of the metastases in esophagus cancer [8]. Despite the high frequency of distant metastasis to the lung, bone, liver, and brain observed in esophagus carcinoma, only a few cases were reported as being related to metastatic breast disease.

The studies showed that the lymphatics originating from the thoracic esophagus frequently drain into the thoracic duct directly without intervening lymph nodes [8, 9]; since the thoracic duct has multiple collateral branches with the intercostal vessels, it can reach the internal mammary chain and may spread to the breast.

In general, treatment should be directed to the primary malignancy; usually the prognosis is poor and surgical resection of breast metastasis suffices only if metastases in other sites are not present or being controlled [5].

In conclusion breast metastasis in esophagus cancer is an extremely rare disease; the diagnosis should be highly suspected in any breast mass with a previous history of esophagus cancer, especially in the presence of multiple metastases. When the breast mass is the only reported metastasis, the case reports revealed that the surgical excision of the metastasis showed an acceptable result on the short-time follow-up; however, more studies are needed for correct treatment choices. We reported the largest breast metastasis in esophagus cancer that involved the left chest muscle and the pleura, without any other obvious radiological metastases. The possibility of this phenomenon may elucidate part of the anatomical network pathway of esophagus cancer.

Competing Interests

The authors declare that there are no competing interests related to this paper.

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