Abstract

Breast cancer, which is a common cause of cutaneous metastasis, has substantially high mortality and morbidity rates in women. Skin metastasis of breast cancer usually occurs at the adjacent anterior chest wall, and scalp metastasis is very rare. Due to these rates, the preliminary diagnosis of the skin metastasis of breast cancer can be overlooked in case of a scalp mass, and this can result in inadequate or extra surgery. In this paper, we present the rare case of a patient who presented to our clinic with a scalp mass, and was operated with a preliminary diagnosis of a pyogenic granuloma; however, the patient’s histologic assessment revealed a diagnosis of late-term scalp metastasis of a breast mucinous carcinoma.

Keywords: Breast cancer, skin metastasis, scalp

INTRODUCTION

Breast cancer constitutes 26% of all cancer types seen in women and ranks second among all fatalities caused by cancer in this population. In the United States, about 1.3 million women were diagnosed with breast cancer in 2007 and 465 thousand deaths due to breast cancer occurred in the same year. On this account, breast cancer comes forth as a major health issue whose prevalence has been seen to significantly increase in the past 25 years and for which new diagnostic and imaging procedures are being developed.

Breast cancers are the most frequent causes of cutaneous metastases that can occur through local, lymphatic, or hematogenous pathways. While distant skin metastases of primary malignancy occur more often through the hematogenous pathway, their direct dissemination is attributed to lymphatic invasion or iatrogenic implantation. Cutaneous metastases of breast cancer are mostly seen in adjacent regions like the frontal chest wall, whereas distant skin metastases are rarer and often occur subsequent to the involvement of other organs.

This case report aims at presenting a case that was operated on with a preliminary diagnosis of pyogenic granuloma to the scalp; however, in later microscopic evaluation, late-stage scalp metastasis associated with mucinous breast cancer was diagnosed.

CASE PRESENTATION

An 81-year-old female patient applied to our clinic with a six-month-old growing mass to her scalp. Her physical examination found an immobile nodular lesion of 2.5 × 2 × 2 cm localized to the left parieto-occipital region and elevated from the skin with sporadic bleeding spots and small sites of ulceration (Figure 1). The patient’s history revealed that she had undergone left modified radical mastectomy 18 years ago, and she received 8 doses of postoperative chemotherapy as adjuvant therapy. Her last follow-up examination was 1 year ago, and no recurrent or metastatic occurrences were identified during the follow-up period. Further, no radiological or biochemical abnormalities were observed in her follow-up examinations.
In the absence of any other complaints or comorbidities, the patient was taken to surgery with a preliminary diagnosis of pyogenic granuloma. After obtaining her required consent, the mass was excised and the site was reconstructed with a partial-thickness graft under local anesthesia (Figure 2).

Preoperative preparations included the evaluation of the patient’s complete blood count, bleeding/clotting times, anti-HIV, anti-HCV, HBsAg, and electrocardiogram results, wherein no abnormal findings were identified. Biochemical parameters were not checked after these tests were performed.

The excised material, which was preliminarily diagnosed with pyogenic granuloma, was sent to the pathology laboratory together with a note explaining about the patient’s breast cancer history. Macroscopic examination revealed a gray-white colored tumor of $2.5 \times 2 \times 2$ cm subcutaneously localized to the dermal and subdermal tissue and covered by a partially ulcerated skin layer of $3 \times 3 \times 5$ cm. In the histopathological evaluation, an infiltrative tumor was observed in the subepidermal region. The tumor showed moderate pleomorphism comprising irregular ductus-like formations on a desmoplastic base and atypical ductal epithelium cells that displayed high mitotic activity (Figure 3).

Immunohistochemical examination revealed strong nuclear positivity of estrogen and progesterone receptor antibodies in about 100% neoplastic cells (Figures 4, 5). Moreover, diffuse and high GCDFP-15 positivity was found in the tumor cells (Figure 6). Examination performed with Her2 (c-erb B2) antibody found no membranous positivity in the neoplastic cells. Morphological and immunohistochemical findings were consistent with “metastatic breast carcinoma.”

Positron emission tomography (PET) scan following the pathology report showed increased focal fluorodeoxyglucose (FDG) uptake (maximum standardized uptake value (SUV-max): 8.4), which indicated metastasis in the $26 \times 19$ mm lesion. This had spread under the skin without infiltrating the cerebral tissue and impacted the cortical lysis in the left part of the parietal bone outside of the surgical area (Figure 7). Further, increased FDG intake was identified in the lateral right process of T1, in the vertebral corpus of T4, and in the...
posterior of the eighth left rib (SUVmax: 9.4). Increased FDG intake (SUVmax: 8.1) was found in the mass localized to the anterior of the right upper lobe of the lung, extending from the pleura to the paramediastinal region. Increased FDG intake (SUVmax: 8.3) was found in 2 lymph nodes in the right hilar region and in 1 lymph node in the lower right paratracheal region. The described increased metabolic foci were deemed to be associated with recurrence characterized by the metastases from the primary tumor to the bone marrow, lungs, and lymph nodes. The patient was diagnosed with metastatic breast carcinoma and referred to the Medical Oncology Department for consultation. Since further surgical treatment was not advisable given the widespread systemic involvement, the patient was scheduled for chemotherapy.

DISCUSSION

Breast cancer is the most prevalent malignancy among women, and patients are seen to apply to clinics either with complaints such as a small mass in the breast or with complaints associated with a larger mass involving the entire breast, abnormal breast contour, asymmetrical breast, shrinking breast tissue, axillary/supraclavicular lymph node enlargement, or other systemic metastases. While in 10% of the breast cancer cases, metastases to other organs are identified within the first 3 years, these are often seen to occur in the lungs, bones, lymph nodes, liver, and pleura. Distant skin metastases of breast cancer are characterized by findings such as erythematous or inflammatory lesions, granulomatous lesions, generalized morphea, appearance of telangiectasia, nodular or ulcerated skin lesions, and alopecia areata on the scalp. In our case, the lesion was a painless, immobile nodular mass that elevated from the skin's surface with sporadic spots of bleeding and ulceration. While these findings were initially considered to be a pyogenic granuloma, an excisional biopsy was performed for eliminating the patient's symptomatic complaints and for attaining a definitive diagnosis. Following the pathological assessment, however, the lesion was identified to be late-stage scalp metastasis from breast cancer.
Taking into account all the types of malignancies, the prevalence of skin metastases varies between 0.7% and 9%. The most common causes among women are breast cancer (69%), colon cancer (9%), and malignant melanoma (5%), and those among men are lung cancer (24%), colon cancer (19%), and malignant melanoma (13%). While breast cancer is the most common cause for cutaneous metastasis among women, inflammatory carcinoma is the form that has the highest predilection for metastasis. Our case, on the other hand, had a history of mucinous breast cancer. Mucinous breast carcinoma is a rare type of breast cancer that constitutes 1–6% breast carcinoma cases. Mostly seen in elderly women, local recurrence or distant metastasis is rather rare in this form of breast cancer.

With respect to the anatomic distribution of malignancy-related skin metastases among the female population, the skin of the trunk is seen to be the most common site of metastasis and more often from breast and lung cancers. Apart from these, colorectal cancers are the leading sources of site-specific metastases and often tend to metastasize to the abdominal or perianal region. Given its immobile and rich vascular structure, the scalp offers a permissive environment for tumor metastases. While scalp metastases in men are often seen to be secondary to lung and kidney tumors, in women, breast cancers also due to their high prevalence are seen to be the primary cause.

Skin metastasis can occur, though rare, years after the primary tumor has been treated. In their analysis of 6,298 melanoma patients, Schmid-Wendtner et al. identified that 31 patients had presented with the first findings of skin metastasis 10 or more years after their treatment. In breast cancer cases, skin metastases usually emerge within the first 5 years; however, no studies were found on the late-stage skin metastasis rates of these malignancies. There are, however, several case reports in the literature that describe late metastasis from mucinous breast cancer.

As more time passes since the primary malignancy, both the patient and the doctor can overlook such cases and disregard the possibility of metastasis as accounting for the patient’s medical complaints. This can lead to delays in diagnosis. In our case, even though multi-systemic involvement was identified in PET scanning, the patient expressed no complaints associated with a systemic involvement; rather, the patient mainly complained about the mass on the scalp. Given the time since the treatment of her breast cancer and that no unusual findings were identified in her routine follow-up, the lesion was initially deemed to be a pyogenic granuloma, and a diagnosis was reached following the biopsy. Therefore, regardless of the time since the primary malignancy, we believe that when an atypical skin lesion is observed, advanced examination methods should be employed or excisional or incisional biopsy should be performed depending on the size and site of the lesion and further systemic screening should be considered when pathological findings indicate the presence of metastatic skin uptake. Furthermore, while preoperative screening is performed with regard to the tendency for bone metastasis in breast cancer, the examination of biochemical parameters such as ALP that can be indicative of bone metastasis could be of importance.

CONCLUSION

Clinicians should always consider the probability of a metastatic tumor in examining skin lesions. The diagnoses of such lesions can facilitate the quick and accurate identification of treatment targeting the underlying condition; hence, knowledge about the characteristics of skin lesions that are capable of metastasizing, especially from breast cancer, colorectal cancer, lung cancer, hematogenous malignancies, and melanoma, are of particular importance. To that end, malignancy should be investigated when taking the medical history of patients. Further, it should be noted that patients, discounting their past malignancies, may not mention these in their anamnesis and mislead the clinician in their surgical decision.

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