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Case Report

Ipsilateral breast metastasis from squamous cell carcinoma of the right index finger: an unusual presentation

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ABSTRACT

Metastatic involvement of the breast by extramammary malignancies is uncommon and may clinically and radiologically mimic primary breast carcinoma. Metastatic squamous cell carcinoma (SCC) to the breast is particularly rare. We report an unusual case of ipsilateral breast metastasis from SCC of the right index finger in a 59-year-old woman. The patient presented with pain and purulent discharge from an ulcerated lesion over the right breast with an underlying palpable mass. She had a previous biopsy-proven SCC of the right index finger, treated with wide local excision without adjuvant chemotherapy or radiotherapy. Ultrasonography showed a well-circumscribed complex solid mass with central cystic areas and slightly irregular margins. Contrast-enhanced computed tomography demonstrated an irregularly marginated heterogeneous breast lesion with cystic areas extending into the infraclavicular region. Fine-needle aspiration cytology revealed a poorly differentiated malignant neoplasm. Wedge biopsy showed malignant cells arranged predominantly in groups and sheets with extensive necrosis. Immunohistochemistry showed strong positivity for cytokeratin and p40, while estrogen receptor, progesterone receptor, HER2/neu, GATA3, and mammaglobin was negative. The findings supported metastatic SCC to the breast. Metastatic SCC to the breast may closely mimic a primary breast malignancy clinically and radiologically. The absence of an intraductal component, together with the patient's previous cutaneous SCC and immunoprofile, supported a metastatic rather than primary breast origin. Accurate diagnosis requires integration of clinical history, imaging, histomorphology, and immunohistochemistry to distinguish metastatic SCC from primary breast carcinoma and guide appropriate management.

Keywords: Breast metastasis, Squamous cell carcinoma, Cutaneous squamous cell carcinoma, Metastatic breast lesion, p40, GATA3

INTRODUCTION

Metastatic involvement of the breast by a non-mammary primary malignancy is an uncommon clinical entity. Such metastases have been reported in approximately 0.5%–3% of patients with extramammary cancers and account for about 0.5%–1.5% of all malignant breast lesions.[1,2] The spectrum of primary tumors capable of metastasizing to the breast is broad, although lymphomas, leukemias and malignant melanoma constitute the more frequently described sources.[3] Breast metastases have also been documented from a variety of other primary malignancies, including ovarian, prostatic and gastric carcinomas, malignant mesothelioma and rhabdomyosarcoma.[4,5] The spectrum of primary tumors varies with age. Among adults, malignant melanoma and neuroendocrine-like tumors, notably small cell carcinoma and carcinoid tumors, are the predominant source of breast metastases, while in the pediatric population, rhabdomyosarcoma accounts for the majority of breast metastases.[6] Although cutaneous squamous cell carcinoma (cSCC) is generally associated with a favorable prognosis, it can exhibit

metastatic potential and lead to substantial morbidity and mortality. Approximately 5% of patients with primary cutaneous SCC develop metastatic disease within five years.[7] Metastatic spread most frequently involves the regional lymph nodes, followed by sites such as the lungs, liver, brain, skin and bone. Infrequent patterns of dissemination, including involvement of skeletal muscle and other soft tissues, have also been described.[8,9] Metastatic SCC involving the breast is particularly unusual. Among the reported cases, Hsu et al. described breast involvement secondary to squamous cell carcinoma of the lung, while Demirkazik et al reported breast metastasis originating from cutaneous SCC.1,10 Subsequently, Galyfos et al. described a rare case of SCC arising from the hand with metastasis to the breast.2

Thus, breast involvement by SCC originating from a distal cutaneous site remains an exceptionally uncommon occurrence, with only a limited number of cases described in the literature. Such lesions may clinically and radiologically mimic a primary breast malignancy, making recognition of their metastatic origin challenging. We report a rare case of ipsilateral breast metastasis from squamous cell carcinoma of the right index finger in a 59-year-old woman, highlighting an unusual pattern of metastatic dissemination and the importance of integrating clinical history, histomorphology, and immunohistochemical findings to distinguish metastatic SCC from a primary breast carcinoma.

CASE REPORT

A 59-year-old woman presented with pain and purulent discharge from an ulcerated lesion over the right breast, associated with an underlying palpable mass. On clinical examination, a firm, round mass measuring approximately 2 × 1 cm was palpable in the upper outer quadrant of the right breast. The mass was adherent to the overlying skin and was associated with an ulcer measuring 1 × 0.5 cm, from which purulent discharge was noted. The patient was a known case of type 2 diabetes mellitus. She had a history of biopsy-proven squamous cell carcinoma (SCC) of the right index finger, for which she had undergone wide local excision. She had not received any adjuvant chemotherapy or radiotherapy.

Routine laboratory investigations were unremarkable. Ultrasonography of the right breast revealed a well-circumscribed, complex solid mass with central cystic areas, slightly irregular margins, and no evidence of microcalcifications. Contrast-enhanced computed tomography (CECT) of the chest revealed a large, ill-defined, irregularly marginated nodule in the upper quadrant of the right breast, showing heterogeneous enhancement with areas of cystic degeneration and extension into the infraclavicular region.

Fine-needle aspiration cytology (FNAC) of the lesion revealed a poorly differentiated malignant neoplasm. In view of the inconclusive cytological findings and the need for definitive tumor characterization, a wedge biopsy was performed and submitted to the Department of Pathology, Pt. B. D. Sharma University of Health Sciences, PGIMS, Rohtak, for histopathological examination.

Gross examination revealed a skin-covered, grey-brown soft-tissue fragment measuring 1 × 0.5 × 0.5 cm. Histological examination showed focally ulcerated, skin-covered soft tissue infiltrated by malignant cells arranged predominantly in groups and sheets along with numerous foci of necrosis. Immunohistochemical evaluation demonstrated strong positivity for cytokeratin (CK) and p40, supporting squamous differentiation. The tumor cells were negative for estrogen receptor (ER), progesterone receptor (PR), HER2/neu, GATA3, and mammaglobin. The Ki-67 proliferation index was approximately 15–20%.

In conjunction with the patient's previous history of biopsy-proven SCC of the right index finger, the morphological findings, absence of features supporting a primary breast carcinoma, lack of an intraductal component, and the immunohistochemical profile, the lesion was diagnosed as metastatic squamous cell carcinoma to the right breast from the primary SCC of the right index finger.

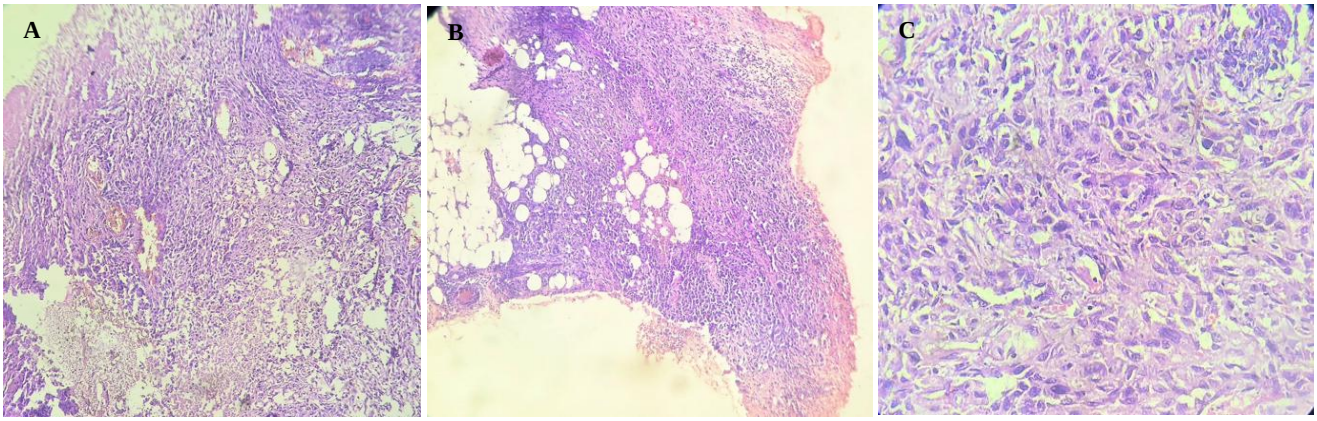


Figure 1: H and E stained sections showing soft tissue infiltrated by malignant cells arranged predominantly in groups and sheets at (A and B) 100x (C) 400x.

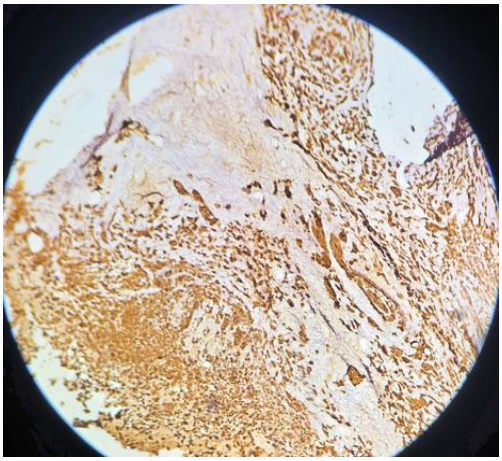


Figure 2: Microscopic image showing diffuse CK positivity in the tumor cells (100x).

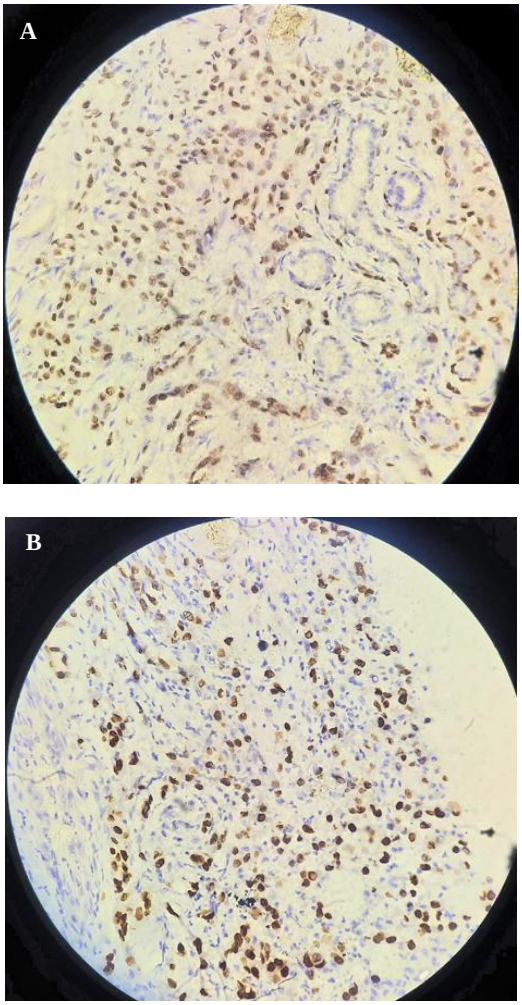


Figure 3: Microscopic image showing p40 positivity in the tumor cells (A and B) 100X.

DISCUSSION

Metastatic involvement of the breast by extramammary malignancies is uncommon and may present a diagnostic challenge because its clinical and radiological features can closely mimic those of primary breast carcinoma. Breast metastases have been reported predominantly in women, with women being affected approximately five to six times more frequently than men.[11] In addition, breast involvement frequently occurs in the setting of disseminated malignancy. Chaignaud et al reported that breast metastasis was associated with disseminated disease in the majority of patients in their series.[1] In contrast, our patient presented with a solitary breast lesion without evidence of additional metastatic deposits, representing an unusual pattern of disease dissemination.

The spectrum of malignancies capable of metastasizing to the breast is broad and includes malignant melanoma, hematological malignancies, sarcomas, ovarian carcinoma, and malignant pleural mesothelioma.[3-5,12] The clinical presentation may vary depending on the primary tumor and extent of disease. Most patients have a known history of an extramammary malignancy, although breast involvement may occasionally be the initial manifestation of metastatic disease.[13] In the present case, the previous diagnosis of biopsy-proven SCC of the right index finger provided an important diagnostic clue.

Cutaneous SCC has recognized metastatic potential, although distant metastasis remains relatively uncommon. The commonly reported sites include regional lymph nodes, lungs, liver, brain, skin, and bone, while metastases to skeletal muscle and other soft tissues are distinctly unusual.[7,8] Cutaneous SCC may metastasize despite apparently limited primary disease, and the risk of metastatic spread is influenced by several clinicopathological factors.[12] In the present case, the development of a breast metastasis from SCC of the index finger represents an exceptionally uncommon route of distant dissemination.

Breast metastasis from SCC is particularly rare. Several cases of SCC of the lung metastatic to the breast have been reported. Hsu et al. described squamous cell carcinoma of the lung metastatic to the breast, while Chattopadhyay et al subsequently reported another case of pulmonary SCC presenting with breast metastasis.[9,10] Demirkazik et al described breast metastasis from cutaneous SCC and emphasized the importance of recognizing its characteristic imaging appearance.[14]

The closest published comparison to the present case is the report by Galyfos et al who described SCC of the hand metastasizing to the breast.[15] Their patient was a 68-year-old woman with SCC of the right index finger who developed a solitary lesion in the ipsilateral breast without axillary lymphadenopathy.[15] The similarity to our patient is striking, particularly with respect to the primary site, laterality and solitary nature of the breast metastasis. However, our patient was younger, aged 59 years and presented with pain, ulceration, and purulent discharge from the breast lesion. Furthermore, FNAC in our case demonstrated a poorly differentiated malignant neoplasm but was insufficient for definitive tumor categorization,

necessitating tissue biopsy and immunohistochemical evaluation. These differences further emphasize the variable clinical and pathological presentation of this rare metastatic phenomenon.

An important diagnostic challenge in the present case was distinguishing metastatic SCC from primary squamous cell carcinoma of the breast. Primary squamous cell carcinoma of the breast is rare and requires exclusion of a primary squamous malignancy at another site as well as direct extension from the overlying skin. Histological findings that may favor metastatic disease include morphology unusual for a primary breast carcinoma, a relatively well-circumscribed tumor, absence of an intraductal component, and the presence of lymphatic tumor emboli.[16] In our case, the absence of an intraductal component, together with the patient's known history of SCC of the right index finger, supported a metastatic rather than primary breast origin.

Radiological findings may provide additional clues to the metastatic nature of a breast lesion. Metastatic deposits are often described as relatively well-circumscribed, round or oval masses with slightly irregular margins and without the microcalcifications, spiculation or prominent desmoplastic reaction commonly associated with primary breast carcinomas.[2,14,17] In our patient, ultrasonography demonstrated a well-circumscribed complex solid mass with central cystic areas, slightly irregular margins, and no microcalcifications. These findings were compatible with the reported imaging appearance of breast metastases, although they are not specific enough to establish the diagnosis independently.

The imaging appearance of metastatic lesions can nevertheless be variable. Ultrasonographically, metastatic breast lesions may appear as hypoechoic masses with little or no surrounding architectural distortion, while CT may demonstrate solitary, multiple or bilateral lesions, sometimes accompanied by axillary lymphadenopathy.[18] In our patient, CECT revealed a large, ill-defined, irregularly marginated nodule showing heterogeneous enhancement with cystic areas and extension into the infraclavicular region. No additional breast lesions or axillary lymphadenopathy were identified. The solitary nature of the lesion is particularly noteworthy because it parallels the imaging findings reported by Galyfos et al. in their patient with SCC of the right index finger metastatic to the ipsilateral breast.[15]

Fine-needle aspiration cytology can establish the presence of malignancy and may assist in distinguishing metastatic disease from primary breast carcinoma. However, cytological differentiation may be difficult when the metastatic tumor is poorly differentiated or when there is morphological overlap with primary mammary malignancy. Wood et al highlighted the usefulness of FNA in diagnosing extramammary malignancies metastatic to the breast, while also demonstrating the importance of correlating cytological findings with clinical history and other investigations.[13] In our case, FNAC suggested a poorly differentiated malignant neoplasm but did not establish its origin. Consequently, a wedge biopsy was performed for definitive histopathological assessment.

Histopathological examination demonstrated malignant cells arranged predominantly in groups and sheets with foci of necrosis. Immunohistochemical evaluation showed positivity for CK and p40, supporting squamous differentiation. The tumor cells were negative for ER, PR, HER2/neu, GATA3, and mammaglobin. The absence of breast-associated markers, particularly GATA3 and mammaglobin, together with the squamous phenotype and the known history of SCC of the index finger, supported a metastatic rather than primary mammary origin. Immunohistochemistry has an important role in the evaluation of problematic breast lesions, particularly when morphology alone is insufficient to distinguish primary from metastatic disease.[19]

The absence of an intraductal component was another important morphological finding in our case. Metastatic tumors generally reach the breast through hematogenous or lymphatic dissemination and therefore do not demonstrate the in situ or intraductal component that may accompany primary breast carcinoma.[16] The combination of a relatively circumscribed lesion, absence of an intraductal component, the patient's previous extramammary SCC, and the immunohistochemical profile therefore provided a coherent basis for diagnosing metastatic SCC.

The recognition of metastatic disease has important therapeutic implications. Metastatic breast lesions should not be mistaken for primary breast carcinomas because the treatment approaches differ substantially. Chaignaud et al emphasized the importance of recognizing extramammary tumors metastatic to the breast, particularly to avoid inappropriate surgical treatment.1 Similarly, careful review of previous pathological material, together with appropriate biopsy and ancillary studies, can facilitate accurate diagnosis and prevent unnecessarily radical breast surgery.[1,13] In the present case, establishing the metastatic nature of the breast lesion was essential for appropriate clinical management.

The present case is particularly noteworthy because it closely resembles the previously reported case by Galyfos et al in several respects. Both patients had SCC arising from the right index finger and subsequently developed a solitary metastasis in the ipsilateral breast without axillary lymphadenopathy.[15] However, our patient presented with a symptomatic ulcerated breast lesion associated with pain and purulent discharge, whereas the previously reported patient had a palpable breast lesion without such local ulceration.[15] In addition, histopathology and an immunohistochemical panel were necessary to establish the diagnosis in our case because FNAC was inconclusive. Thus, although the metastatic pathway appears remarkably

similar, the clinical and pathological presentation may vary.

The unusual metastatic pattern observed in our patient should also be considered in the broader context of cutaneous SCC. Although regional lymph nodes and visceral organs represent the more recognized sites of metastatic spread, reports of intramuscular and other soft-tissue metastases demonstrate that uncommon patterns of dissemination can occur.[7,8,12] Breast involvement is particularly unusual, and the occurrence of an isolated ipsilateral breast metastasis from SCC of the right index finger represents a distinctive manifestation of metastatic cutaneous SCC. Overall, this case emphasizes the importance of considering metastatic disease in the differential diagnosis of a breast mass in a patient with a previous extramammary malignancy. Clinical history, radiological characteristics, histomorphology, and immunohistochemistry should be interpreted together to distinguish metastatic SCC from primary breast carcinoma. Awareness of this rare metastatic presentation is essential to avoid misdiagnosis, prevent potentially unnecessary extensive breast surgery, and facilitate appropriate management of the underlying malignancy.

CONCLUSION

Metastasis of squamous cell carcinoma from the index finger to the ipsilateral breast is exceptionally rare and may mimic a primary breast malignancy clinically and radiologically. A history of extramammary malignancy, careful histopathological evaluation, and appropriate immunohistochemistry are essential for accurate diagnosis. Recognition of this unusual metastatic presentation can help avoid misdiagnosis and unnecessary extensive breast surgery and facilitate appropriate management.

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