



A Rare Case of Breast Cancer Metastasis to Oral Cavity Soft Tissue

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Authors' contributions

This work was carried out in collaboration among all authors. Author JRS designed the study, wrote the protocol and first draft of the study. Author SJ collected the relevant history and wrote the final draft. Authors ZC and NS reported the histopathology of the specimens and collected the relevant photographs. Author RM carried the literature search. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Distant metastasis from primary breast cancer to oral cavity is a very rare entity. Many case reports of lytic bony metastasis have been reported in literature but involvement of only soft tissue of oral cavity is very rare. It may be a diagnostic challenge to clinician if it is the isolated site of distant metastasis. We report a very rare case of breast cancer metastases to oral cavity soft tissue.

Keywords: Distant metastasis; oral cavity; breast cancer; soft tissue.

1. INTRODUCTION

Breast carcinoma, one of the most common carcinomas in female has shown to have a wide

range of metastatic pattern, the most common of which includes lung, bone, lymph nodes, liver, and pleura [1]. Metastasis to the gingiva has not been mentioned in any of these large studies

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published on metastatic patterns of breast cancer. This suggests that gingival metastasis of breast cancer is an uncommon presentation. Very few cases of distant metastasis to the gingiva without involvement of the underlying bone have been reported. We describe a case report of a patient of breast cancer with metastasis to the gingiva and buccal mucosa.

2. CASE PRESENTATION

29-year premenopausal lady presented in January 2019 with a large breast lump since 2 months. On examination hard mobile lump of size 10x8 cm was found in left breast with involvement of overlying skin and extensive peau d'orange covering nearly whole breast. Mass was not involving underlying muscles. A large 6x3 cm conglomerated axillary lymph node was found in ipsilateral axilla. Right breast and axilla revealed no significant abnormality.

Core needle biopsy revealed infiltrating ductal carcinoma (IDC) grade II. IHC was not possible due to extensive necrosis in the biopsy sample. Staging workup which included contrast-enhanced computed tomography of thorax, abdomen and pelvis (CECT TAP) and bone scan revealed no distant metastases. Patient was given NACT (Neoadjuvant chemotherapy) with 4 cycles of AC (Adriamycin-cyclophosphamide) regimen. Post NACT mammogram revealed 6x4 cm mass in left upper outer and lower outer quadrant with peau d'orange in lower inner quadrant. She underwent left Modified radical mastectomy with TRAM (Transverse rectus abdominis muscle) flap. Histopathology revealed residual high grade IDC, margins free, 0/14 lymph nodes, pT3N0M0. IHC revealed triple-negative disease.

She was started on adjuvant chemotherapy with 4 cycles of paclitaxel and was referred for adjuvant radiation after completion of adjuvant chemotherapy.

While on Radiation therapy she developed local flap recurrence and was excised under local anesthesia. Histopathology of the excised recurrent lesion revealed IDC Grade 3 with margins free. Estrogen receptor(ER) +(3/8), Progesterone receptor(PR)+(4/8), Herceptin receptor (HER 2 NEU) negative, Ki -67 index 75-80%. PET CT revealed metabolically active perivascular node and fine-needle aspiration cytology proved it to be metastatic. She was then treated as oligo metastatic can breast cancer

with 2 cycles of Gemcitabine and carboplatin as second line chemotherapy. While on second line chemotherapy reassessment CECT TAP revealed progressive disease in the form of increasing size of the perivascular node and newly appearing bilateral metastatic pulmonary nodules. She was then planned for palliative hormonal therapy.

After 2 months of hormonal therapy she present with an ulceroproliferative lesion of about 4x 3 cm size in left buccal mucosa and gingivobuccal sulcus, non-tender, does not bleed on touch. CECT neck shows ulceroproliferative lesion in left buccal mucosa and Gingivobuccal Sulcus (GBS) starting from left canine up to retromolar trigone without mandibular involvement (Fig. 1).

Punch biopsy revealed metastatic adenocarcinoma with Estrogen (ER)+(3/8), Progesterone(PR)+(4/8), Herceptin (HER 2 NEU) negative. Biopsy revealed fibro collagenous tissue infiltrated by tumor cells. These cells were arranged in small clusters and vague glandular pattern. The tumor cells were round to oval with pleomorphic, hyperchromatic to vesicular nuclei, occasional nucleoli, and moderate cytoplasm. (Fig. 2 A,B,C,D). Fragments of mature stratified squamous epithelium were also noted along with areas of necrosis.



Fig. 1. Picture of ulceroproliferative growth over left buccal mucosa without involvement of bone

On immunohistochemistry, the tumor cells were positive for CK7, GATA3, Estrogen Receptor (Allred score 3/8), Progesterone Receptor (Allred score 4/8) and p40, while they were negative for CK20, mamma globulin and Her2/ neu (Score 1+) (Fig. 2 E-L).

Based on the histological and immunohistochemical profile, it was concluded that the lesion was suggestive of metastatic breast carcinoma with squamous/myoepithelial

differentiation. Patient was referred for palliative chemotherapy.

3. DISCUSSION

The diagnosis of metastasis to the oral cavity is a challenge to the clinician because of the lack of pathognomonic signs and symptoms. A high index of clinical suspicion is necessary when evaluating patients with a history of no head and neck carcinoma. Metastatic lesions to the oral cavity from distant tumors are uncommon, accounting for only 1% of all oral malignancies. They mainly involve the bony structures (particularly the mandible), whereas primary metastases to soft tissues are extraordinarily rare (only 0.1% of oral malignancies). The mandible is affected more frequently than the maxilla, with a predilection for the areas distal to the canines, including the body and ramus [2,3,4]. These sites are considered vulnerable to the deposition of neoplastic cells because of the presence of hematopoietic bone marrow, branching of the local blood vessels and slowing of blood flow [4].

The most common sites of soft tissue involvement are the gingiva, tongue, lips and the buccal and palatal mucosa. The primary tumors are mainly lung, breast, kidney and colon [5]. Among the list of primaries reported as gingival metastasis are the kidney, lung, liver, gastrointestinal tract (GIT) and choriocarcinomas

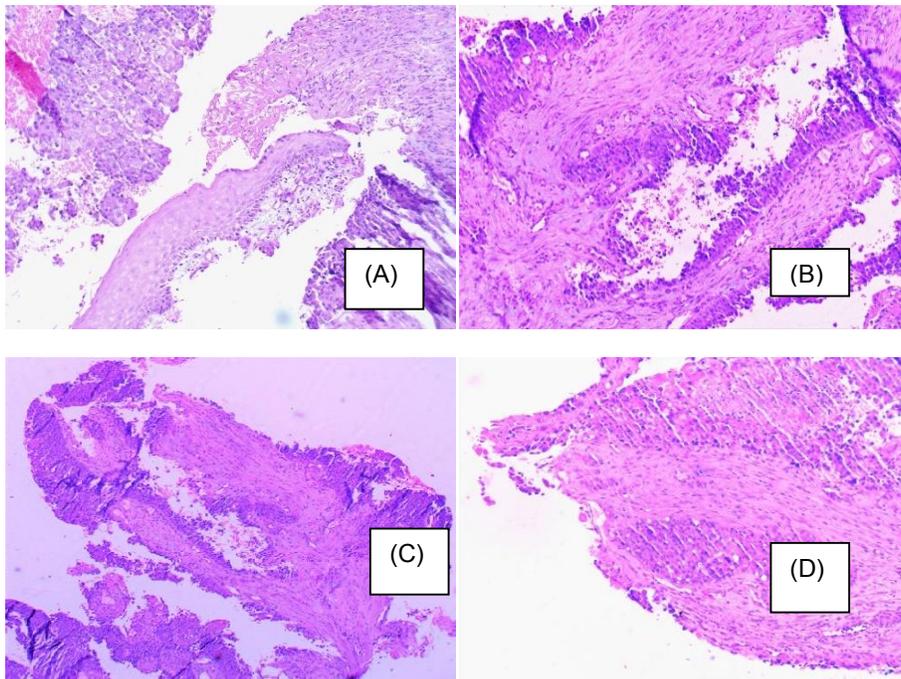
[6,7]. Breast cancer metastases to oral cavity generally involve jaw bones but metastasis only involving the gingival soft tissue with sparing of the underlying bone is rare [8].

This case presented with an ulceroproliferative lesion in the buccal mucosa and gingiva. The rich capillary network of chronically inflamed gingiva has been suggested as a mechanism that entraps malignant cells. The proliferating capillaries have a fragmented basement membrane through which tumor cells can more easily penetrate. These could be the reasons for the occurrence of metastatic tumors commonly in the gingiva [9].

Bony metastases of the oral cavity are 3 times more likely with breast cancer than with any other malignancy; however, breast cancer metastasis rarely result in soft tissue oral cavity disease [10,11].

When the soft tissues of the oral cavity are involved with metastatic disease, the attached gingiva is the most common location, followed by the tongue [12].

Clinically, early gingival metastases are polypoid or exophytic, highly vascularized, and resemble hyperplastic or reactive lesions such as pyogenic granuloma, giant cell granuloma, and peripheral fibroma [13,14].



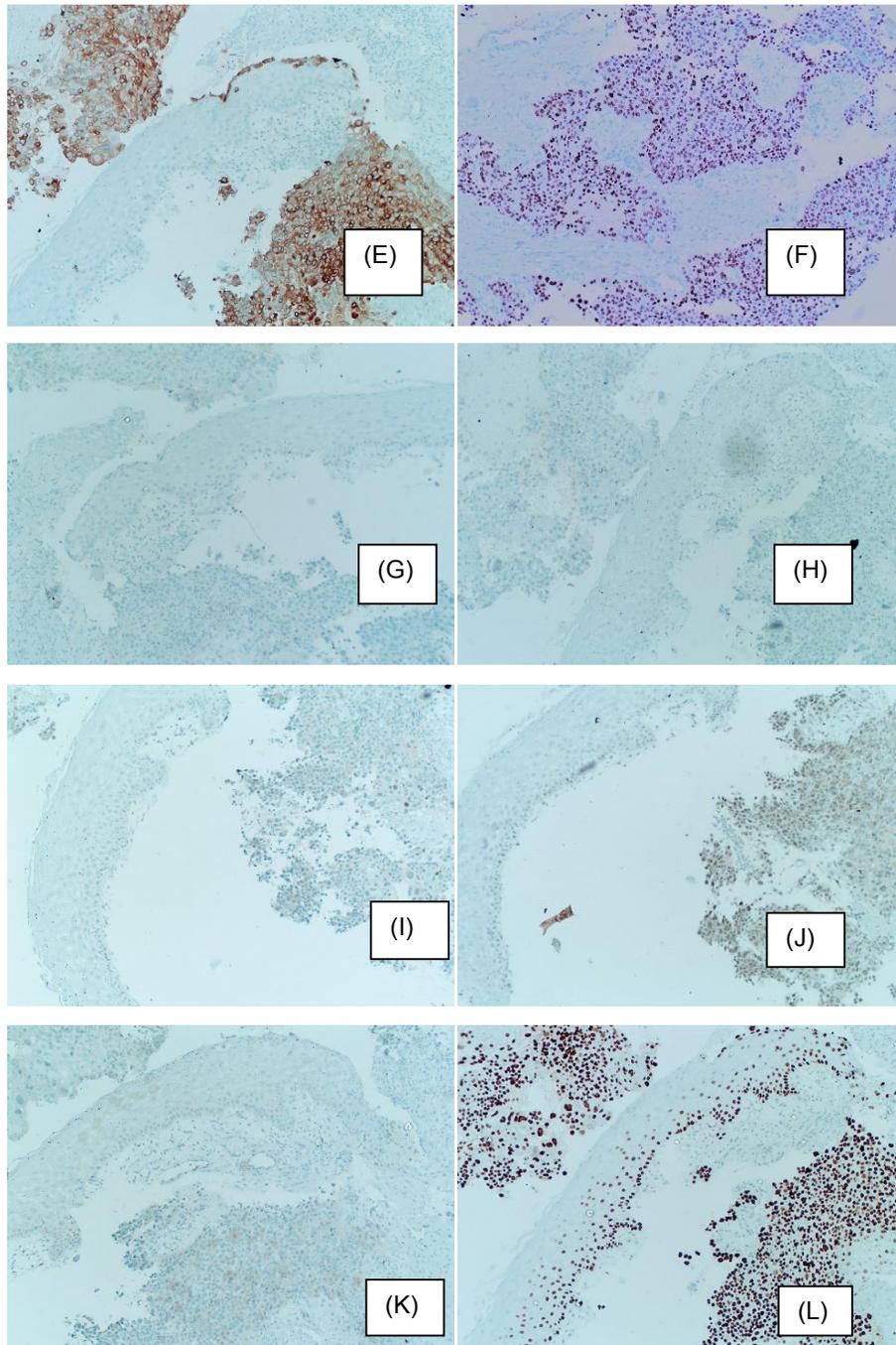


Fig. 2. (A)Shows stratified squamous epithelium along with fibro collagenous tissue infiltrated by tumor cells (HE, 100x) (B)Shows fibro collagenous tissue bits infiltrated by tumor cells present in papillary fragments (H&E, 10x)C) Shows fibro collagenous tissue bits infiltrated by tumor cells present in papillary fragments (H&E, 2x) (D) Tumor cells arranged in papillary fragments (H&E, 10x) (E) positive for CK7 (IHC, 100X), (F) negative for CK20 (IHC, 100X), (G) positive for GATA3(IHC, 100X), (H) negative for mammaglobin (IHC, 100X), (I) focally and weakly positive for Estrogen Receptor (IHC, 100X), (J) focally and weakly positive for Progesterone receptor (IHC, 100X), (K) negative for Her2/Neu and is (L) positive for p40

Inflammatory reaction such as gingivitis or periodontitis could be critical factors to facilitate metastasis. Some degree of inflammation in the gingival tissue can be found in most people. In chronically inflamed gingiva, the capillary network constantly proliferates and develops fragmented basement membranes [15]. The role of inflammation in the attraction of metastatic cells has been suggested previously, and it might be the reason for a higher frequency of metastasis in the attached gingiva. On the other hand, there are some reports of metastasis to the post-extraction site, which indicate the role of local factors in the extraction or wound area that may attract circulating tumour cells. Tooth extraction may serve as a promoting factor in metastasis as it creates a microenvironment rich in growth factors. It is suggested that tooth extraction site is a microenvironment rich with local growth factors which favor the growth of metastatic cells [16].

Oral metastases usually occur in the advanced stages of cancers, and the interval between appearance and death is usually short. Therefore, due to a high mortality rate, patients with oral lesions, particularly those with a history of a malignancy, deserve a careful diagnostic procedure. Even with the diagnosis of a primary lesion, it is necessary to make a definite diagnosis of oral lesions for appropriate treatment. The oral soft tissue metastasis can be easily recognized compared to jawbones metastasis. Early detection of oral lesions is important in the case of being the first sign of a malignancy in other parts of the body.

The management of metastatic breast carcinomas of the oral cavity is primarily palliative and may include radiotherapy, chemotherapy, hormone therapy and, rarely, surgical intervention. Pain relief and avoidance of possible infections, fractures or hemorrhage should be the major goals [17]. Local radiotherapy is almost always the treatment of choice as it relieves pain prevents loss of function and arrests growth of the tumor [18,19]. A combination of surgical excision and radiation therapy is useful.

5. CONCLUSION

We present a rare case of breast cancer metastasizing presenting with metastasis to the oral cavity as the first site of distant metastases. This reinforces the necessity of maintaining a high index of suspicion for metastatic lesions, even in the most unlikely locations, when

examining patients with a personal history of malignancy.

CONSENT

As per international standard or university standard written patient consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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