

CASE REPORT

A benign appearing metastatic breast carcinoma to the mandible: A case report

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Abstract

Metastasis of breast carcinoma to the oral cavity is extremely rare as compared to metastasis to the lung and liver. The non-specific presentation of metastatic lesions clinically and radiographically also pose a diagnostic challenge. We present an interesting case of metastatic carcinoma to the right mandible which was provisionally diagnosed as a benign lesion of the alveolar ridge.

Keywords: Metastasis, breast carcinoma, mandible

INTRODUCTION

Metastasis of neoplasms to the oral cavity is rare and accounts for only 1-1.5% of tumours within this anatomical region.¹ In women, metastasis frequently originates from the breast and the commonest oral site is the mandible (41%).² Literature on metastatic breast carcinomas are mainly obtained from case reports.³⁻¹² To date, only eleven cases of metastatic breast carcinoma have been reported in the oral cavity while others occur within the head and neck region.³⁻¹² Hence we present a case of metastatic breast carcinoma to multiple body areas including the mandible, which was initially thought as a benign lesion.

CASE PRESENTATION

A 76-year-old lady presented to our Oral and Maxillofacial Surgery Department with a right zygomatic and bilateral medial condylar head of the mandible fractures due to a previous fall. Her medical history included diabetes mellitus, hypertension and arterial fibrillation. She had a history of right breast invasive ductal carcinoma with mucinous component, with T2N2M0 when first diagnosed in 2018. The breast carcinoma was positive for oestrogen receptor (ER), progesterone receptor (PR) and negative for human epidermal growth factor (HER2). She had a mastectomy and axillary clearance without any

adjuvant therapy in 2018. In 2020, she relapsed with brain, bone, and lung metastases. She was on three-monthly intravenous Zoledronic acid and was newly started on TS-One chemotherapy medication.

Upon review of her maxillofacial injuries, she mentioned a growth in her oral cavity. There was a large bluish-pink or translucent well-defined nodule on the right lower alveolar ridge over the molar region (FIG 1a). The nodule was bluish, smooth-surfaced with soft to firm consistency in some areas. Certain areas were fluctuant and appeared to be fluid-filled. Hence, the first clinical impression was a mucocele which could have occurred due to incidental trauma of the upper opposing tooth.

Dental Pantomograph (DPG) imaging showed scalloped border of the right body of mandible (FIG 1b). Radiological impression was erosion likely due to the enlarging size of the lesion. Subsequently, a biopsy was performed and the specimen was submitted for histopathological examination.

Histopathological examination revealed diffuse infiltration of malignant tumour cells into the underlying connective tissue. Neoplastic cells were arranged in clusters and cords floating within pools of mucin. The tumour cells displayed medium-sized hyperchromatic nuclei with inconspicuous nucleoli and scanty

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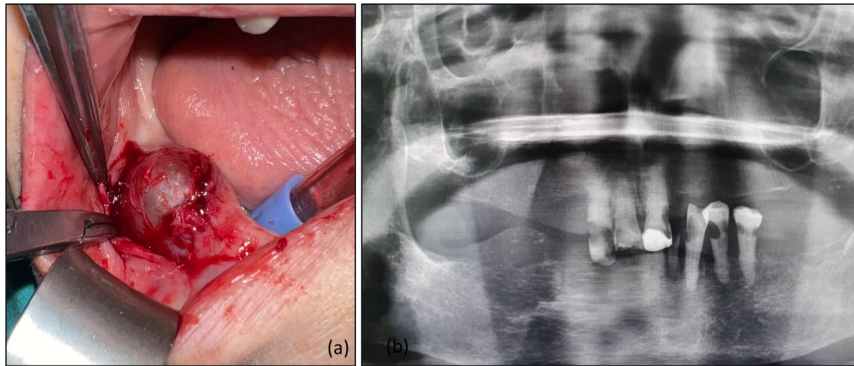


FIG 1: Photographs show (a) Sessile swelling on right lower alveolar ridge region; (b) DPG showing a multilocular radiolucency on the right body of mandible.

cytoplasm. Focal areas exhibited the formation of signet-ring cells. Mitosis was occasionally seen, and the surrounding stroma showed areas of hyalinisation admixed with extracellular mucin and haemorrhage. The underlying bone

showed evidence of invasion (FIG 2). Further immunohistochemical studies showed the neoplastic cells were diffusely positive for ER and were negative for CK7, CK20, PR and WT1 (FIG2b (inset)). The tumour morphology is

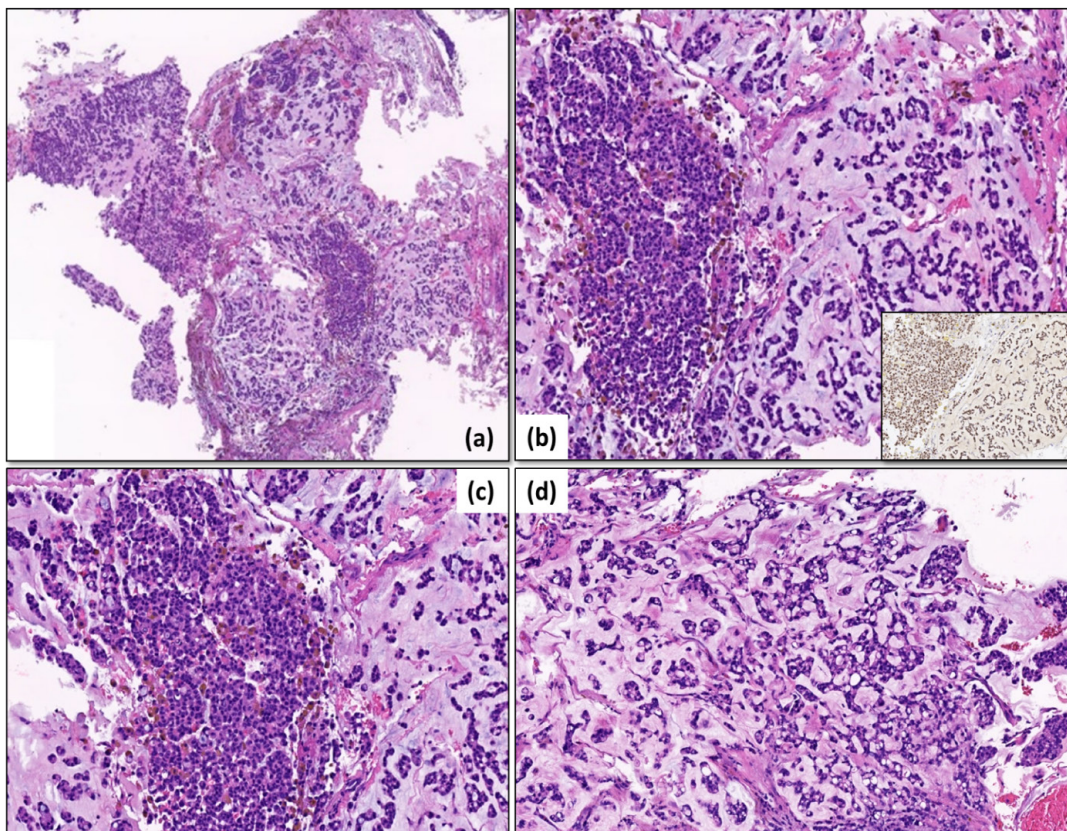


FIG 2: Photomicrograph shows (a) Clusters and cords of malignant cells floating in mucin (H&E, 40×); (b) The tumour cells are arranged in nests, tubular cords and individual cells. Focal areas exhibit pseudocribiform pattern with immunoreactivity to ER (inset) (H&E, 100×); (c) The cells display medium-sized hyperchromatic nuclei, inconspicuous nucleoli and scanty cytoplasm (H&E, 200×); (d) Few tumour cells exhibit vacuolation and microcystic degeneration is evident (H&E, 200×)

similar to the breast primary, however, the slides from the primary breast lesion were not available for comparison as it was performed in a different hospital. Therefore, a diagnosis of metastatic carcinoma of breast origin was established. Unfortunately, the patient succumbed to the advanced breast carcinoma before any further treatment modalities could be initiated by the Oncology team.

DISCUSSION

The incidence of breast carcinoma has increased slightly by 0.3% yearly and has caused over 601,100 deaths worldwide. Distant metastasis is common for breast carcinoma, however, spread towards the head and neck region is rare. The common distant metastasis sites include bone (3.28%), followed by lungs (1.52%), liver (1.20%) and brain (0.35%).¹³ This brings upon significant challenge to the clinician in diagnosing metastasis within the oral cavity due to the lack of pathognomonic features. Signs and symptoms are non-specific with numerous presentations such as pain, ulceration, bleeding, paraesthesia, trismus and even pathological fracture of involved bone. Yet, some may remain asymptomatic. Radiological assessment commonly exhibits a radiolucent osteolytic lesion with poorly defined irregular margins as observed in our case. Rarely do they present as a mixed radiolucent and radiopaque entities.⁶ Reported cases of metastatic breast carcinoma to the oral cavity, including the present case are shown in (TABLE 1).

The mandible is favoured more than the maxilla due to the presence of bone marrow alongside local blood supply and steady blood flow. From (TABLE 1), we can observe that the site within the oral cavity can be varied with most cases presented as either swelling or non-healing ulcer. A dominance of invasive ductal carcinoma (IDC) histological subtype is also seen over pagetoid carcinoma (PC) and lobular carcinoma (LC) subtypes. It is also shown that the longest interval of metastasis from initial diagnosis is of the LC subtype. This may be attributed to increased hormone receptor positivity in LC compared to IDC. Besides that, low-differentiated tumours are more commonly associated with IDC than LC.¹⁴ A larger cohort study established that LC tumour bear mutations within key pathways of PIK3/PTEN/Akt/mTOR which improves progression free survival of patients with LC.¹⁵

ER and PR positive expression suggest tumour cell growths are driven by these hormones and will respond towards hormonal therapy. Meanwhile, HER2 is a tyrosine kinase receptor expressed in 15-20% of invasive breast carcinoma. The positivity of HER2 indicates aggressiveness while negative tumours commonly respond to targeted therapy.¹⁶ Despite positive expression of ER and negative expression of HER2 of both primary and metastatic tumour cells in our case, the patient already had lymph node metastasis and she did not receive adjuvant therapy at initial diagnosis, further worsening her prognosis. Our patient had the relapse two years post-surgery and had developed metastasis to multiple sites by this stage. Based on the literature, the average survival time of patients with metastatic tumours is within 6 to 7 months, with about 70% of mortality rates within the 1st year of diagnosis.¹²

Currently, there is no standard therapy regime for metastatic breast cancer. Its main aim is to provide control of the disease and improve the patient's quality of life (QoL). Treatment options are implicated by many factors including patients' demographics (e.g., age, menopausal state, comorbidities) and tumour growth factors (e.g., HER2 status). Thus, there is no correct or incorrect treatment approach as the treatment of choice is highly dependent on patient's circumstances. Ongoing clinical studies are constantly clarifying the roles of chemotherapy, endocrine therapy, biological therapy and the results are promising.

In conclusion, oral metastases may appear clinically and radiographically benign within the dental setting, causing a low index of suspicions of such lesions. However, in many instances' the patient would already have a history or clinically present with an existing neoplasm elsewhere. Therefore, in any suspected oral lesions in patients with history of breast carcinoma, a differential diagnosis of metastasis from the primary site should be considered. This emphasises the need for a thorough history taking, clinical examination followed by relevant and necessary ancillary tests and investigations to be conducted. Ultimately, the aim is to avoid any delay in diagnosis and management of the patient.

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TABLE 1: Clinicopathological features of metastatic breast carcinoma in the oral cavity

No	Case	Age	Clinical presentation	Histological type	Interval of metastasis from initial diagnosis (months)
1	Adelson <i>et al</i> ³	48	Right vestibular mass	-	24
2	Pratap <i>et al</i> ⁴	24	Tongue	Invasive ductal carcinoma	10
3	Syah <i>et al</i> ⁵	25	Upper alveolar gingiva	Infiltrating duct carcinoma	12
4	Polius <i>et al</i> ⁶	55	Right third molar region	Invasive ductal carcinoma	-
5	Jain <i>et al</i> ⁸	30	Right buccal mucosa	Infiltrating duct carcinoma	12
6	Ranka <i>et al</i> ⁹	50	Right buccal mucosa	Infiltrating duct carcinoma	-
7	Ndiaye <i>et al</i> ¹⁰	43	Lower left gingiva	Infiltrating duct carcinoma	7
8	Miyazaki <i>et al</i> ¹¹	66	Right buccal mucosa	-	1
9		39	Painful and edematous gingival hypertrophy	Ductal carcinoma	128
10	Gondim <i>et al</i> . ¹²	52	Erythematous and edematous gingiva and retromolar trigone	Pagetoid carcinoma	63
11		78	Buccal mass	Lobular carcinoma	216
12*		76	Lower alveolar ridge nodule	Invasive ductal carcinoma with mucinous component	29

*Current case

Informed Consent Statement: Informed consent was obtained from the patient and family of patient in this case report.

Authors' Contribution: NI; Conceptualization; formal analysis; writing. NIMA; Formal analysis; editing; review. NR; Formal analysis; supervision; review. RR; Supervision; review; final approval of the manuscript. All authors have read and agreed to the published version of the manuscript.

Conflict of Interest: The authors declare no conflict of interest.

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