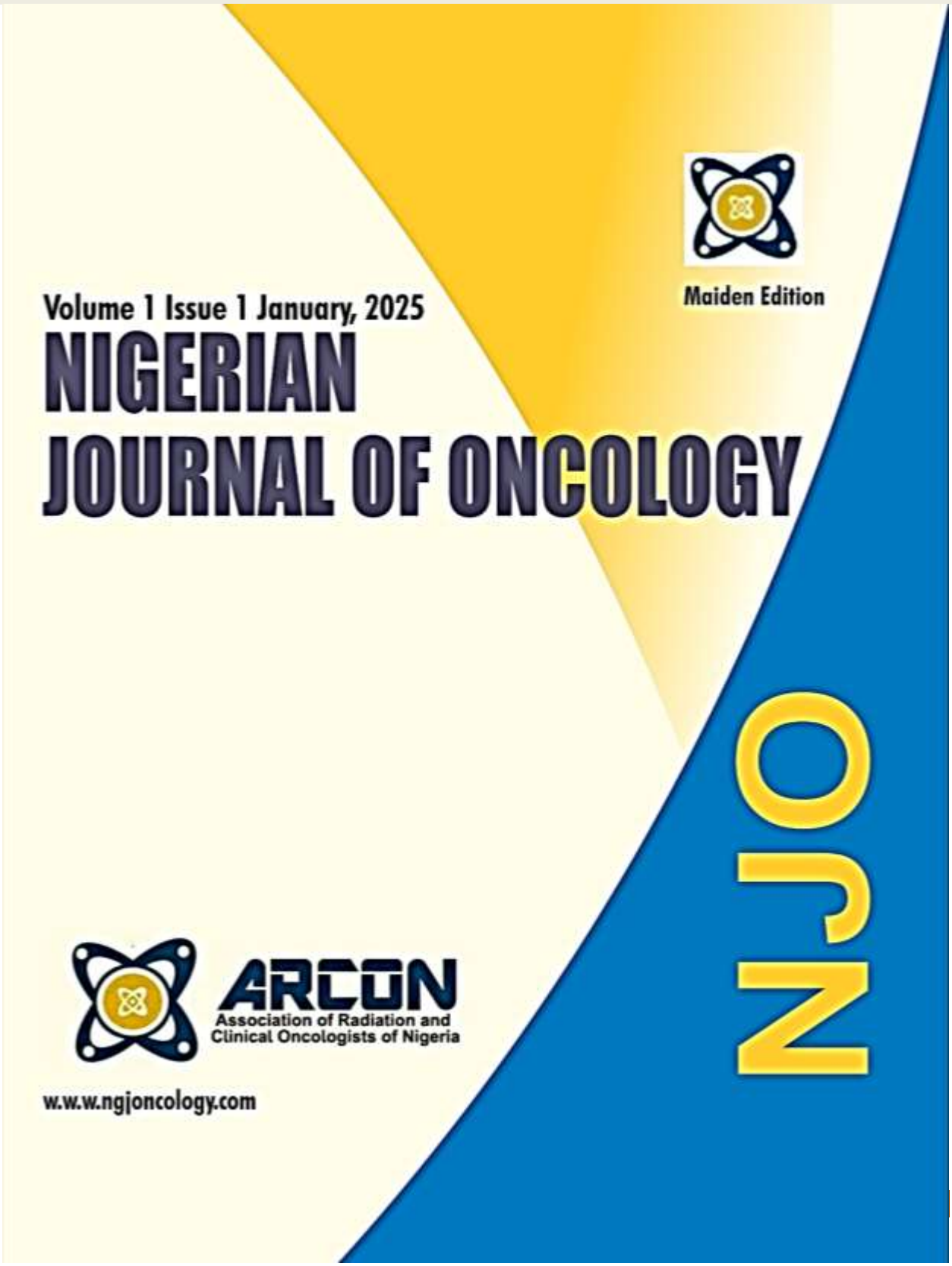
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# METASTATIC BREAST CARCINOMA TO THE MANDIBLE: A CASE REPORT

**Bolanle Adegboyega[1,2], Adegbayi Adekunle [3], John Omomila[1], Emeka Aforka[2], Adewumi Alabi[1,2], Sunday Adewuyi[4]**

1- NSIA-LUTH Cancer Centre, Lagos state
2- Department of Radiotherapy, Lagos University Teaching Hospital
3- Department of Oral and Maxillofacial Surgery, Lagos University Teaching Hospital
4- Department of Radiation and Oncology, Ahmadu Bello University Teaching Hospital

**Corresponding author:**
Bolanle Adegboyega- abecee2001@yahoo.com

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## ABSTRACT

**Introduction:** Breast cancer is a leading cause of cancer-related mortality in women globally, especially in low and middle-income countries due to late presentation and limited access to specialized care. Metastatic spread significantly impacts morbidity and mortality rates. While metastasis in breast cancer commonly targets organs such as the lungs, liver, bones, brain and pleural; occurrences in the oral and maxillofacial region are rare, accounting for only 1-3% of oral malignancies. Here, we report a rare case of mandibular metastasis from breast cancer, a scarcely documented phenomenon in the Sub-Saharan region.

**Case presentation:** The patient, a 52-year-old postmenopausal woman, initially diagnosed with invasive ductal carcinoma of the breast, underwent mastectomy with axillary lymph node involvement and received adjuvant chemotherapy, chest wall radiotherapy and hormonal therapy. Subsequently, she presented with toothache and jaw numbness, and the eventual diagnosis of mandibular metastasis after further workup and imaging. Palliative bone radiotherapy and targeted therapy with ado-trastuzumab emtansine were initiated, resulting in satisfactory disease regression.

**Conclusion:** Mandibular metastasis, although rare, poses diagnostic challenges due to its resemblance to benign oral conditions. Our case underscores the importance of considering metastatic disease in patients with a history of breast cancer presenting with oral lesions even after having extensive timely treatment, further emphasizing the need for thorough evaluation and prompt intervention.

**KEYWORDS**: Breast cancer, mandibular bone metastasis, radiation therapy, hormonal therapy

## INTRODUCTION

Breast cancer is the most common cancer in women and the second most common cause of cancer-related deaths in women worldwide.[1,2] This is even more important for low- and middle-income countries where this is compounded by late presentation and inadequate access to specialist care.[3]

Breast cancer metastasis contributes significantly to the morbidity and mortality of the disease with about 30% of breast cancer survivors eventually developing metastatic disease.[4]

Metastasis in breast cancer is commonly seen in the lungs, liver, bones, pleura, brain, and kidneys. Metastasis to the oral and maxillofacial region is generally rare and accounts for only about 1-3% of oral malignancies.[5–7]

We present a case of mandibular metastasis from a breast cancer primary, one of the few case reports on this from the Sub-Saharan region.

### Ethical Considerations

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

## CASE REPORT

A 52-years-old postmenopausal woman presented in February 2020 to our facility after an incidental finding of a right breast mass detected on routine mammogram screening eight months prior to presentation. She had a biopsy then, which was inconclusive and subsequently had a lumpectomy in July 2019 which revealed invasive ductal carcinoma (Scarff-Bloom-Richardson (SBR) grade 2).

A mastectomy was done in August 2019 which showed axillary lymph nodes metastases (11 of 17 nodes were involved). Immunohistochemistry (IHC) was triple positive (Estrogen Receptor (ER), Progesterone Receptor (PR) and Human Epidermal Growth Factor Receptor-2 (HER2)) in January 2020.

### Management and Outcome

We administered adjuvant chemotherapy with six courses of Cyclophosphamide, Doxorubicin and 5-Fluorouracil and 4 courses of Paclitaxel (175mg/m$^2$) which were completed in June 2020. She had external beam radiotherapy at a dose of 42Gy in 16 fractions to the chest wall and axilla in July 2020.

Herceptin (Trastuzumab) was given at 600mg 3 weekly for 18 cycles which was completed in April 2021. She was also started on hormonal therapy (aromatase inhibitor) and was followed up as an outpatient.

In February 2023, she complained of toothache and right jaw numbness so she was referred to the dentist for which she had a tooth extraction done.

She returned to the clinic in April 2023 with swelling in the right posterior mandible, which was initially small but later extended to involve the buccal cavity and posterior alveolus.

A CT head and neck was done which showed a lytic lesion in the right mandible with multiple suspicious cervical lymph nodes. Whole body PET CT scan showed a tumor in the ramus of the right mandible.

Histology revealed a malignant glandular neoplasm while immunohistochemistry showed tumor cells diffusely positive for cytokeratin 7 and HER2 whereas staining for Cytokeratin 20 (CK20), ER, PR, Caudal-type homeobox 2 (CDX2) and Thyroid transmission factor 1 (TTF1) were negative. Overall, the features were in keeping with metastatic breast cancer.

She was then started on palliative radiotherapy to the mandible at 36Gy in 10 fractions. We also placed her on ado-trastuzumab emtansine every 3 weeks, zoledronic acid infusion every 4 weeks along with regular echocardiogram monitoring.

The latest Positron Emission Tomography and Computed Tomography (PET-CT) scan revealed disease regression.

## DISCUSSION

Breast cancer metastasis remains a significant problem globally, remaining a persistent and ever-growing cause of cancer related morbidity and mortality in women. In fact, despite notable advancements in our understanding of cancer and more targeted chemotherapies, about 10 to 52% patients who were initially diagnosed with local or regional breast cancer eventually develop distant recurrence.[8–10] Similarly, data from the USA show that the 5-year survival rate for patients with metastatic breast cancer was 31%.[11]

These numbers are even more important in our context, as Nigeria has one of the world's highest age-standardized mortality rates for breast cancer, the highest in Africa and also the lowest three-year survival rate compared to several other African countries, at 36% according to a study. [12,13]

Breast cancer metastases commonly spread to the lungs, liver, bones, pleura, and kidneys. Primary tumors of the mandible, which can be odontogenic or non-odontogenic, malignant or benign, include ameloblastic carcinoma, dentigerous cysts, chondrosarcoma, ossifying fibroma etc.[14] Metastasis to the mandible is rare and accounts for roughly 1% of all oral tumours.[5,6]

The affected area in our patient was the mandibular ramus, a location that aligns with the expected pathophysiology of metastatic mandibular lesions. These lesions, when they occur, typically involve the posterior aspect of the mandible, extending distally from the canines and encompassing both the body and ramus. This predilection is attributed to the mandible's retention of hematopoietic properties, promoting cell growth, influencing local blood vessels, and reducing blood flow velocity [15]

The clinical signs and symptoms are myriad and can range from being completely asymptomatic[15] to more commonly, tender bony swelling, paresthesia, halitosis, tooth loosening and mobility, hemorrhage and pathological fracture.[16] Our patient presented with a swelling in the right posterior mandible that gradually increased in size over several weeks and eventually involved the buccal cavity and posterior alveolus. The symptoms were noted shortly after a tooth extraction (lower right second molar). It is important to note that some of these symptoms resemble odontogenic infections and dental caries and attention may not be drawn to it initially as a possible manifestation of the disease. Mandibular metastasis can also present with sensory symptoms such as dental pain in the

third molar region with one of the most common sensory signs being paresthesia of the area innervated by the mandibular alveolar dental nerve.[17]

There have been some reports in literature where discovery of oral metastases followed shortly after tooth extraction and is possible the extraction may promote the metastatic process.[18]

Interestingly, oral cavity metastases have been reported as the first clinical symptom of a primary malignancy in up to a third of cases.[16,19] However, our patient presented with symptoms of mandibular metastasis, about three years post-treatment commencement with optimum chemoradiation and over a year after being in remission. This highlights the importance of maintaining a high index of suspicion no matter the disease or treatment stage.

The management of patients with distant metastases to the jaw bones is usually palliative to improve the patient's quality of life and manage any associated orofacial complications such as odynophagia, halitosis etc. The identification of oral metastases usually means widespread metastatic burden and therefore heralds a poorer prognosis with combination chemotherapy to alleviate the symptoms as the only preferred therapeutic modality.[6,20] In our case, however, the patient was otherwise healthy and did not have any other site of metastases identified so was therefore commenced on systemic anti HER-2 therapy following palliative bone radiotherapy with good response.

## CONCLUSION

The diagnosis of metastatic jaw bone lesions can be challenging because of their rarity and overlapping clinical features with other benign conditions. We presented a case of a 52-years-old woman with a history of breast cancer who was found to have mandibular metastasis while on hormonal therapy. Therefore, clinicians should maintain a high level of suspicion while evaluating patients with a history of cancer presenting with oral lesions.

## Consent For Publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal

## Competing Interests

The authors declare that they have no competing interests

## Funding

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