Metastasis of breast carcinoma to the whole mandible

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ABSTRACT
Metastatic tumors to the jaw bones are infrequent but not rare phenomenon. Breast is one of the most common sites of distant primary metastatic tumor to the jaw bones. The aim of this paper is to present a breast carcinoma as a metastatic lesion and to emphasize the need for consideration of metastatic lesions in the differential diagnosis of unknown oral lesions, especially in the mandible. Breast carcinoma may appear as dental abscess, periodontal disease, toothache projected into the third molar region or unremitting pain, temporomandibular joint pain, osteomyelitis or trigeminal neuralgia. A panoramic radiograph reveals numerous ill-defined radiolucencies throughout the whole mandible and "moth-eaten' rarefaction. Therefore, although it is uncommon, but the possibility of breast carcinoma metastasize to the mandible should be considered in making the differential diagnosis of inflammatory lesions that are common to jaw bones..

Key words: breast cancer, mandible, metastasis, radiography

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INTRODUCTION
Metastatic tumors to the jaw bones or oral cavity are uncommon.-3 Because of their rarity, the metastatic tumors to the oral region are challenging to diagnose. The metastatic process is complex and involves sequential steps. Tumors cell must detach from the primary tumor, spread in the tissues, invade blood vessel, and survive their travel in the circulation. Then, the metastatic cells settle in the micro vasculature of the target organ, extravasate through the vessel wall and proliferate within the recipient tissue.3

Breast cancer is the most frequent metastatic lesion to the jaw bones especially to the whole mandible.1,2,4 It may appear as dental abscess, periodontal disease, toothache projected into the third molar region or unremitting pain, temporomandibular joint pain, Osteomyelitis or trigeminal neuralgia. Breast cancer continues to be one of the leading causes of death among women because of its metastasis.

Many cases were reported concerning to breast cancer as the frequent metastatic lesions to the jaw bones. According to Clousen and Poulsen, the primary carcinomas metastatizing that most frequently to the jaws were those (33%) of the breast.2 Zachariades reviewed 422 literature metastatic lesions in the mouth, jaw and surrounding lesions and found of these, 18% origins from the breast. Lu and Chen reported a case of mandible metastasis as the initial manifestation of breast carcinoma. Leibovich and Buchner found from their previous review of 157 metastatic cases that the primary site for women is the breast followed by the adrenal, female genital organs and thyroid. The purpose of this article was to present a breast carcinoma as a metastatic lesion and the need for consideration of metastatic lesions in the differential diagnosis of unknown oral lesions, especially in the mandible.

Metastasis of breast carcinoma
Metastatic or secondary carcinoma is second only to primary carcinoma of the jaws. The most common malignancies to metastasize to the jaws are from primary sites in the breast, lung, stomach etc. Carcinomas which are transported to an area distant from their origin are said to have metastasized. Metastasis is traditionally accepted as one of the criteria which earmark a tumor as malignant. Malignant tumors metastasize by various routes.
Carcinoma metastasizes via the lymphatic to the regional lymph node first and later to distal organs by both lymphatic and bloodstream. Once tumors begin to metastasize, the probability of successful treatment diminishes.

Metastatic lesions may be asymptomatic or painful. They may present as localized unexplained periodontal disease and parasthesia is a common symptom. To be considered metastatic, the following characteristics should be present: the location of primary tumor must be known, it is necessary to demonstrate a distinct margin of normal tissue between the primary and secondary tumor; and the metastatic lesion must possess a high degree of histological similarity to the primary malignancy.2 According to Hirshberg and Buchner, on average, patients with metastasis to the jaw bones are younger (eg. 45 y old) than those with metastasis to the oral soft tissues (eg. 54 y old).

Jung, Cho and Nah reported a case of 37-year-old female that referred to the department of Maxillo facial Radiology by her oncologist for evaluation of dull pain on anterior teeth. The woman was significant for metastatic breast carcinoma and in clinical examination revealed xerostomia, some ulceration on lower lip, and some teeth that didn't respond to the electric pulp test with no apparent cause. A case reported by Hwang and Lee showed a marked facial, gingival swelling, redness of the mandibular region in clinical examination. In addition, tenderness in palpation and a fever.2 Therefore, clinical examination should be considered in the differential diagnosis of inflammatory lesions.

**Radiographic features**

Metastasis tumors to the jaws and oral tissues are only rarely encountered and represent less than 1% of all malignant tumors affecting the mouth. A panoramic radiography revealed numerous ill-defined radiolucencies throughout the whole mandible including both mandibular condyles and coronoid processes (Figure 1).

Closer examination of panoramic radiography revealed possible metastatic involvement of left maxillary posterior region including maxillary tuberosity and also cervical vertebrae. The clinical presentation of metastatic disease to the jaw is non specific, including local pain, swelling, numbness, parasthesia of the lip and chin, and loosening or extrusion of the teeth. Pathologic fractures may also occur but are considered rare (Figure 2).

The cardinal radiographic signs of metastases to the jaw include a well-circumscribed but uncorticated lytic lesion, especially in the posterior mandible, with high irregular outline or multiple small areas of the bone destruction that gradually coalesce to form large ill-defined areas of bone destruction (Figure 2 & 3).
The radiographic appearance is similar to that of squamous cell carcinoma, which is an ill-defined destructive radiolucent lesion that may perforate the cortical plate, and often simulate periodontal disease or periapical infection (Figure 4, 5 & 6).

**Figure 4.** Metastatic carcinoma, primary lesion was in the breast.

**Figure 5.** Metastatic carcinoma of the mandibular canine and premolar region in which the primary lesion was a carcinoma of the breast.

**Figure 6.** Metastatic carcinoma, destructive radiolucencies with recent history of loose teeth. 5 of cases, while maxillary metastasis are less common. 1, 6

Destruction of cortical plate and pathologic fracture was seen (Figure 7), the alveolar lamina dura adjacent to the lesion was lost (Figure 8).

**Figure 7.** Cross-sectional occlusal radiograph showing destruction of cortical plate and pathologic fracture.

**Figure 8.** Periapical radiographs showing loss of alveolar lamina dura. 2

**DISCUSSION**

In female patients, the most common primary cancers that metastasize to the oral region are those in breasts (42%), followed with adrenal gland (8.5%) and colorectum (8%). 10 As stated before, it is well documented that breast cancer or breast carcinoma is one of the leading causes of death among women. Although uncommon, many researchers reported that breast cancer is the most frequent lesion that metastasize to the mandible. Antunes stated that metastasis located in the mandible in 80-90% of cases, while maxillary metastasis are less common. 1, 6
Sachs found that the metastatic lesions occurred in the mandible in all about five of the 63 cases and were located most often in the molar region. To view a large area of mandible, panoramic radiography is frequently used to supplement other examination in making diagnose of breast carcinoma. However, as a dental professionals, we must be able to recognize normal anatomy structures viewed on panoramic radiograph and differentiate with metastatic breast carcinoma (Figure 9).

**Figure 9.** Normal anatomy of the jaws (maxilla and mandible) and surrounding structures seen on panoramic film.

The diagnosis of metastatic breast carcinoma is made as a radiological findings. Radiographic appearance showed unclear radiolucency, therefore it is closely resembled with periodontal disease or periapical infection. Ill-defined destructive radiolucencies throughout the whole mandible which may perforate the cortical plate resembled the radiographic appearance that similar to several type of carcinoma. Considering the radiological findings in the mandible, we expect a possibility of malignant lesions to be metastasized.

Breast carcinoma cause variety of signs and symptoms including swelling, pain, looseness of teeth and parasesthesia. however, in some cases, patients may be asymptomatic Early detection of the disease can lead to appropriate treatment and alleviation of unwanted side effects. This is an area where the dentist may well save a life. Therefore, the dentist and dental practitioner should be aware and make an interpretation of radiography imaging accurately and also check for early clinical signs of breast cancer.

**REFERENCES**
