

Case Report

Breast ductal carcinoma metastasis to jaw bones: a case reportMahmood Reza AshabYamin ¹, Abdoljalil Kalantarhormozi ^{2*}, Fariba Hamdamjo ¹, Zahra Razi ³¹ Department of Plastic and Reconstructive Surgery, Shafa Hospital, Kerman University of Medical Sciences, Kerman, Iran² Department of Plastic Surgery, 15 Khordad Hospital, Shahid Beheshti University of medical sciences, Tehran, Iran³ Department of Medical Physics, Shiraz University of Medical Sciences, Shiraz, Iran**Abstract**

Malignant tumors of the oral cavity which are metastatic are very rare and consist of 1% of malignancies of the oral cavity. Numbness or paresthesia of the lower lip or the chin is the main feature of presence of metastasis in the jaw.

Our patient was a 38 year old woman with chief complaint of pain in the right half of her face, jaw and teeth. Her medical history revealed a radical mastectomy with lymphadenectomy in the left breast because of invasive ductal carcinoma grade II/III and stage IIIA (T2N2M0) without distant metastasis, followed by chemotherapy (before and after the surgery) and radiotherapy two years ago. Following complementary examinations a malignant bone lesion in particular osteosarcoma was suspected. According to this evidence, possibility of early diagnosis of malignant tumors is very important for dentists and maxillofacial surgeons. Symptoms such as paresthesia of the lip and chin is very helpful in differential diagnosis of metastatic lesions from other similar clinical cases especially in patients with history of malignancies which minimize surgical and mental injuries and increase life expectancy of patients.

Keywords: breast cancer, metastatic tumors, numb chin syndrome

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Introduction

Malignant tumors of the oral cavity which are metastatic are very rare and consist of 1% of malignancies of the oral cavity ¹. Breast carcinomas have a high tendency to extend towards other parts of body which usually (in 80% of cases) have osteolytic appearance without a definite border and in 10% of cases they have osteoblastic appearance and the remaining 10% consist of combination of these two appearances ². Hormone therapy and castration lead to conversion of osteolytic lesions to osteoblastic lesions in many cases ³. The most common site of metastatic tumors of the oral cavity is the jaw bones. Among them, the probability of the mandible involvement (especially in angle, premolar and condylar part) is fourfold higher than the maxilla ⁴.

In one study on 390 cases of patients having metastatic tumors, the incidence of metastasis to the jaw bone was 2.5 to 5 times higher than soft tissue, and 5.4% of them did not have any clear radiologic changes ⁵. Another study on 114 patients with oral metastatic tumor showed that metastatic tumors originating from the breast were more than those from the lung and prostate ⁶. According to the results of a study on 24 patients with oral cancer, the most common site of involvement was the mandible and the most common primary breast tumor was carcinoma ⁷. This might be the result of excessive vascular territory in the jaw bones and decrease of blood supply to the bone marrow in this site which leads to trapping of neoplastic cells ⁸.

The majority of metastatic tumors to the jawbones in women originate from the breast, kidney (adrenal gland), colorectal region, reproductive organs and thyroid gland; and in men they originate from the lung,

prostate, kidney and colorectal region^{6, 9}. Jaw bone metastases have a wide variety of clinical symptoms such as osteoalgia, swelling, foul mouth smelling, painful gum, loose or extruded teeth, exophytic growth in soft tissue, trismus and pathologic fractures^{1, 6, 8}. Numbness or paresthesia of the lower lip and chin (Numb-chin syndrome) are the main signs of metastasis¹⁰. The disease can be completely asymptomatic as well^{11, 12}.

Prostate and breast tumors usually arise with radiopaque metastatic lesions. These areas look like sclerotic spots because of inducing new bone cells which is due to stimulation from adjacent normal bones¹³. Their radiographic appearance is similar to gum disorders or preapical infections which can appear in different shapes. For instance, it may present as a single radiolucent cyst with defined or undefined border or multiple radiolucent spots with unclear margin or with punched out view. Occasionally, irregular salt and pepper view or a single radiopaque lesion might be seen as well¹⁴. Differential diagnosis of jaw bone lesions is complex for many reasons, the first of which being their low prevalence. In addition many of the bone lesions are at the center of the bone and cannot be detected by physical examination. They are sometimes asymptomatic and are only detected in routine radiographic tests. So, medical history is not typically helpful enough. Moreover jawbone pathologies are more diverse compared with other bones. For this reason, often these lesions are mistaken with other infectious or inflammatory diseases of the jawbone and adjacent structures because of clinical and radiographical similarities^{15, 16}. However, considering clinical symptoms and medical history, these malignant lesions can be detected and differential diagnosis might be made by complementary tests such as radiography, angiography, serologic tests, biopsy and etc.

In this report, we evaluated a rare and asymptomatic case of breast cancer metastasis to the ramus of the mandible and its inaccurate diagnosis and treatment.

Case Presentation

Our patient was a 38 year old female who complained of pain in the right half of her face, jaw and teeth and referred to the maxillofacial department. Examination of her mouth showed normal mucous membrane and no swelling or bulging. Molar and premolar teeth were

intact with slight cavities. Wisdom tooth or 8th molar tooth of the patient were extracted within the previous 2 months as a result of mistaken dental diagnosis and treatment. She complained of paresthesia and numbness of her lip as well; however, there was no sign of edema, erythema and inflammation of the lip. Physical examination of the external mouth did not show asymmetry. Past medical history showed radical mastectomy with lymphadenectomy because of invasive ductal carcinoma grade II/III and stage III A (T2N2Mx) in the left breast without distant metastasis followed by chemotherapy (before and after surgery) and radiotherapy 2 years ago. The patient has given their informed consent for the case report to be published.

Imaging and radiographic findings: CT scan of the chest and mediastinum showed no abnormality in the lymph node, lung and mediastinum. The right breast was normal either. Ultrasound imaging of the abdomen and pelvis and also CT scan with oral and injection contrast of these sites showed a normal appearance of the liver, kidney, pancreas and spleen in terms of size, density and echo of parenchyma. Para-aortic lymph nodes were reported normal without mass effect. The echo of the liver just increased which suggests lipid changes. However spiral CT scan of the jaw revealed a lytic lesion in the right ramus mandible with swelling of the surrounding soft tissue and some boned tissue. The other parts were normal.

According to the evidence and clinical symptom of paresthesia of the lip, bone malignancy and osteosarcoma was suspected in particular and then complementary tests were performed.

Pathobiology findings: The histograms obtained by flowcytometry performed for separation and counting of cells and analysing several parameters of biomarkers simultaneously in order to diagnose hematopoietic and non-hematopoietic malignancies, no abnormal pathology was found. Hematologic and biochemistry tests, routine serology and urine analysis were normal as well. But assessment of antigen of breast cancer or tumor marker of CA 15-3 which was ordered to assess the patient's response to invasive breast cancer treatment and evaluate recurrence of the disease revealed that it had been escalated to 175.4 Ku/l

(normal is 38 ku/l) which indicates ineffective tumor treatment.

Histopathologic findings: For confirmation of diagnosis, biopsy of the mandible was performed under local anesthesia and through oral cavity. After staining with hematoxylin-eosin (H&E) and histopathologic assessments, neoplastic malignant cells with high ratio of nucleus to cytoplasm (N/C ratio) were observed. Connective tissue had an obvious desmoplastic (fibrotic and adhesive) change; hypochromic nuclei with irregular margins were amongst them alone or bulky. In macroscopic view also irregular brownish spots were visible. According to these findings, the possibility of metastatic adenocarcinoma originating from the breast came about.

Nuclear medicine findings: Technetium scan of the whole body was performed in order to detect other lesions in the body. Besides increased activity in the superior part of the right ramus mandible which was due to the metastasis, another osteolytic lesion was seen in this place. Moreover some degenerative changes of thoracic spine and T2 was detected which might be due to previous radiotherapy procedures.

Discussion

Metastasis is defined as extension and immigration of cancer cells from one tissue to others. Metastases in the oral cavity comprise approximately 1% of all oral malignancies⁶; in 25% of cases it indicates extension of primary tumors and in 23% of cases it is the sign of the presence of unrecognized malignancy in distant parts of the body¹⁷. However the real prevalence of oral metastatic disease might be higher than this, because all cases are not reported thoroughly¹⁸. The rarity of these tumors and insufficient pathognomonic signs make these tumors hardly recognizable. So, differential diagnosis of many inflammatory lesions and wounds in this site must be considered by dentists and maxillofacial specialists¹⁵⁻¹⁷.

Patients usually have vague and different signs which can be similar to dental infection or even the patient may be asymptomatic¹¹. Swelling and pain are the common symptoms of metastatic tumors of the oral cavity¹⁹. Our patient referred to clinic with complaint of pain in the right half of her face, jaw and teeth

without any swelling and peripheral lesion because the lesion was a mass covered by a layer of mucous membrane. The point is that paresthesia of the lip and chin which indicates metastasis and it has been named numb-chin syndrome (NCS) or neuropathy of mental nerve, is a great symptom¹⁰. Involved nerves in NCS include inferior alveolar nerve and its terminal branches and mental nerve. Moreover, paresthesia of the lip and chin, numbness of the teeth and mucous membrane may occur in NCS. Nonetheless, NCS can be iatrogenic and typically occur as a result of teeth anesthesia or injury of the inferior alveolar nerve following improper dental implant placing. The most common neoplasms which come along NCS are lymphoma and metastatic carcinoma of the mandible^{10,20}.

In this case, paresthesia of the lip which was the chief complaint of patient was noticeable. Because it invalidated the dentist's treatment entirely.

So the existence of NCS must be considered as an alarm for dentists and physicians. Patients having NCS must be evaluated for primary neoplasm or recurrent malignant neoplasm. Unfortunately, these types of tumors do not have any certain pathognomonic radiographic appearance, but the most common type is polymorphic radiolucency with unclear margin¹⁹. However, tumors originating from the prostate or breast occasionally have radiopaque metastatic lesions. These sites have nodular sclerosis of patchy appearance due to new bone production following stimulation of normal bone tissue around them¹³. Lytic lesion of the right ramus mandible enclosed by soft tissue swelling and some bone tissue in our case were strong evidence of malignancy, as more than 90% of metastases to the jaw bone look like osteolytic lesions⁵. However in 5% of cases, no pathologic change can be seen in radiography²¹. It should be remembered that clinical signs and radiographic findings of metastatic lesions of the jaw can be misleading, so biopsy of the lesions is essential for precise diagnosis and avoidance of mismanagement and delayed treatment, especially in patients who have history of malignancy^{21,22}.

Recently Khalili et al reported a patient with vague pain in the mandible and paresthesia of lip without mass or swelling in this area, having metastatic lesions in the mandible and degenerative changes in the

vertebral column and knee joint following whole body bone scan. The etiology was a metastatic tumor with breast origin²³.

Another report by J.E.Scipio et al revealed a ductal carcinoma of the breast which had metastasized to the jaw bone. Their patient went to dentist thinking that it might be a dental abscess of the left mandible and the dentist referred him to a maxillofacial specialist. Reviewing of his medical history showed a breast lumpectomy one year ago. The possibility of primary tumor or metastasis was brought to consideration and biopsy was performed which led to diagnosing extended ductal carcinoma similar to breast carcinoma lesions²⁴. Actually in such cases patients are unwilling to disclose their medical history especially cancer which can originate from mental or psychological and sometimes emotional, cultural and social issues. So taking a thorough history, precise examination and cultural and mental consideration can help the physician to take an accurate and early diagnosis.

Prognosis and 5 year survival for patients with metastasis to the oral cavity is generally poor. The main reason for that is the delay in detecting the lesions. Because oral cavity is not a common site for metastasis, the presence of metastasis in it indicates that the tumor is spreading widely in the body^{5, 7, and 21}. Treatments of breast metastatic carcinoma to oral cavity are mostly palliative and consist of radiotherapy, chemotherapy, hormone therapy and occasionally surgery or a combination of them to reduce tumor size in order to maintain the oral cavity's function. Preventing probable infections, fracture and bleeding, and pain relief should also be a part of the main goal of treatment²⁵. Local radiotherapy is almost always the treatment of choice for pain relief, preventing tumor growth and improving function of the organ^{21, 23}. In this case, we took these into account.

Conclusion

This case perfectly shows the importance of paying attention to metastatic lesions of the jaw in spite of limitations of clinical and radiologic evidence. Maxillofacial surgeons and dentists must take a complete medical history and evaluate unusual lesions and radiographies precisely. They must notice typical

symptoms such as paresthesia of the lip and chin in order to reach a differential diagnosis of metastatic lesions from other similar clinical cases which is a clue for detection of patients with metastatic lesions. Early diagnosis of metastasis of malignant tumors is highly important; especially if the patient has a history of breast cancer. This helps us avoid unnecessary tests, minimize surgical and psychological injuries, avoid wasting time and reduce costs and problems for patients. So life expectancy will increase.

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