

Metastatic adenocarcinoma of the mandible

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ABSTRACT

Metastases to the jawbones are found predominantly in the mandible and are rare in relation to the overall spectrum of oral malignancy. Analysis of the literature shows that the most frequent primary sites are the breast, lung, kidney, thyroid, and prostate. Adenocarcinoma of the mandible, whether primary or metastatic, are usually difficult to diagnose clinically. We report a case illustrating the clinical, radiographic, and histologic findings of a metastatic lung adenocarcinoma of the anterior mandible in a 58-year-old male. (*Korean J Oral Maxillofac Radiol* 2004; 34 : 219-23)

KEY WORDS : Neoplasm Metastasis; Adenocarcinoma; Jaw; Lung

Carcinomas which are transported to an area distant from their origin and which establish a new foothold are said to have metastasized. Metastasis is traditionally accepted as one of the criteria which earmark a tumor as malignant. Once tumors begin to metastasize, the probability of successful treatment diminishes. Malignant tumors metastasize by various routes. Carcinomas metastasize via the lymphatics to the regional lymph nodes first and later to distal organs by both lymphatics and bloodstream. Sarcomas on the other hand prefer the hematogenous route initially. Thin walled veins offer little resistance to tumor penetration. Emboli may break off from this penetration and be carried by the venous flow to distant sites.¹

Metastatic tumors to the jaws and oral tissues are only rarely encountered and represent less than 1% of all malignant tumors affecting the mouth.^{2,3} Nevertheless, they do occur at times and when malignant tumor is encountered in the mouth, metastasis must be considered in the differential diagnosis. Worth⁴ and Lichtenstein⁵ have stated that metastatic or secondary carcinoma is the most common malignant tumor of bone. Despite this observation, metastases to the maxilla and mandible are rare.⁶ Bhaskar³ stated that 1 per cent of all malignant tumors of the body metastasize to the jaws. In addition, 1 per cent of all malignant oral lesions have an initial manifestation from a metastatic tumor. According to Friedlander and Singer,⁷ about a third of the metastatic lesions found in the mouth

are the first evidence of the distant primary malignant disease.

Metastases to the jawbones are almost always from primary sites located below the clavicles.⁸ Clausen and Poulsen,⁹ in a review of 97 cases of histologically verified metastatic carcinoma to the jaws, found that the primary carcinomas metastasizing most frequently to the jaws were those of the breast (33%), lung (18%), kidney (16%), prostate (6%), and colon (6%). To be considered metastatic, the following characteristics should be present: the location of the 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.^{8,9}

The purpose of this report is to present a histopathologically proven case of adenocarcinoma of the lung metastatic to the anterior mandible which showed pathologic fracture, and alert the dental profession to include tumors from distant sites in their differential diagnosis of questionable lesions.

Case report

A 58-year-old male patient was referred by her dental practitioner for evaluation and treatment of a radiolucent lesion of the mandibular anterior region. The patient had a 5-month-history of dull pain and gingival swelling of the anterior region of the mandible and a 2-month-history of increasing numbness of his lower lip. He visited the dental clinic approximately 4 days earlier and underwent the mandibular incisors endodontic treatment because of pain. There was nothing significant in his medical history.

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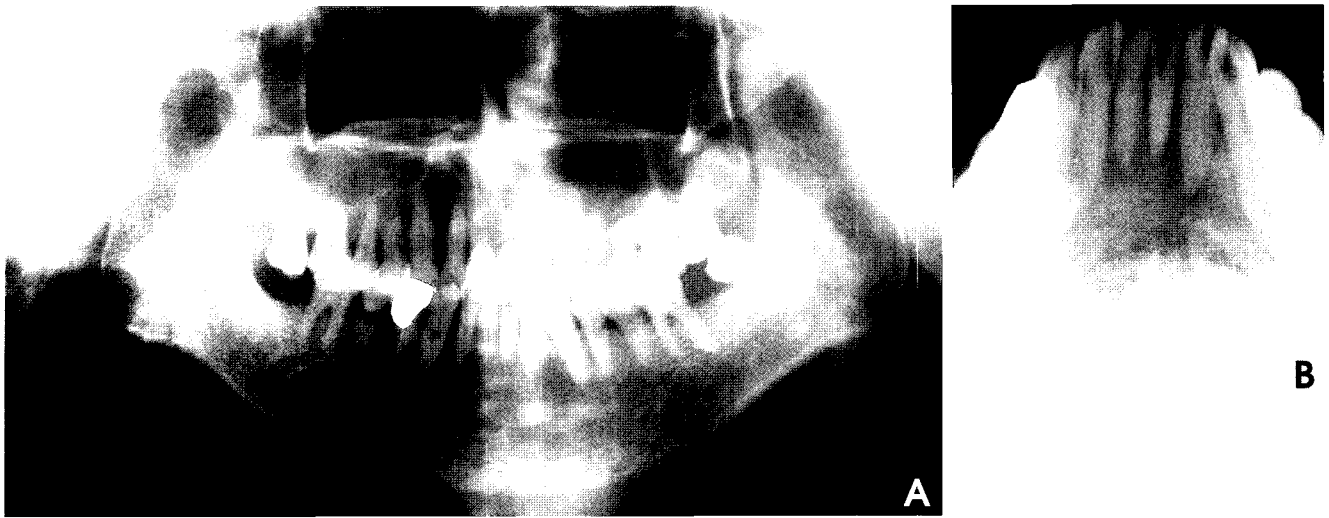


Fig. 1. Panoramic (A) and topographic occlusal (B) radiographs showing an ill-defined, radiolucent lesion extending from the right lateral incisor to the left first molar region of the mandible.

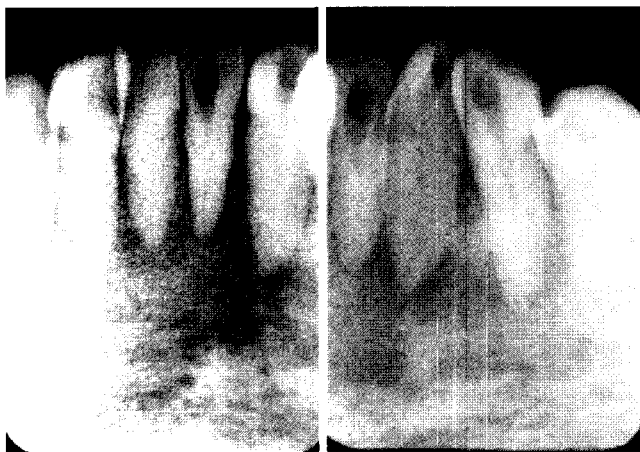


Fig. 2. Periapical radiographs showing loss of alveolar lamina dura.



Fig. 3. Cross-sectional occlusal radiograph showing destruction of cortical plate and pathologic fracture.

Clinical examination showed a marked facial and gingival swelling and redness of the mandibular anterior region, which revealed slight tenderness to palpation and fever. There was no palpable lymph nodes. Plain radiographic examination revealed a poorly defined, osteolytic lesion extending from the right lateral incisor to the left first molar region of the mandible (Fig. 1). The alveolar lamina dura adjacent to the lesion was lost (Fig. 2). Destruction of cortical plate and pathologic fracture was also seen (Fig. 3). A tentative diagnosis of osteomyelitis or malignant tumor was made. A CT scan demonstrated perforation of the labial cortical plate of the mandible and an inhomogeneous mass extending through the labial cortical plate of the mandible into adjacent soft tissues (Fig. 4). A scintigram showed the increased uptake of isotope in the

anterior region of the mandible (Fig. 5). The histology of tissue taken at biopsy showed the lesion to be an adenocarcinoma (Fig. 6). In chest CT scan to possibility of metastatic tumor, probably of lung origin, a lung tumor was detected (Fig. 7). Bronchial cytology was performed; the lung tumor was also diagnosed to be an adenocarcinoma (Fig. 8). The histological findings in the mandibular lesion was completely compatible with those in the lung tumor, which was finally diagnosed to be an adenocarcinoma of the lung metastatic to the mandible.

Discussion

Lung cancer is characterized by insidious onset, difficulty

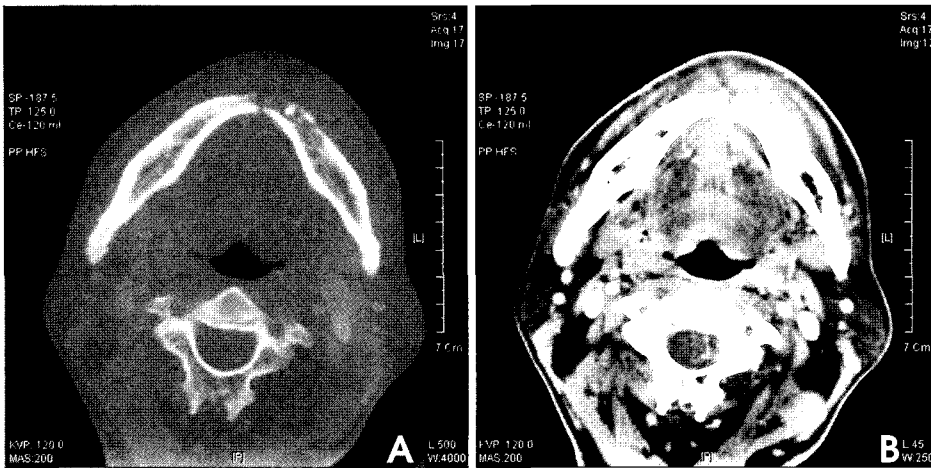


Fig. 4. Bone-window (A) and soft tissue-window (B) axial CT scans showing perforation of the labial cortical plate of the mandible and an inhomogeneous mass extending into adjacent soft tissues.

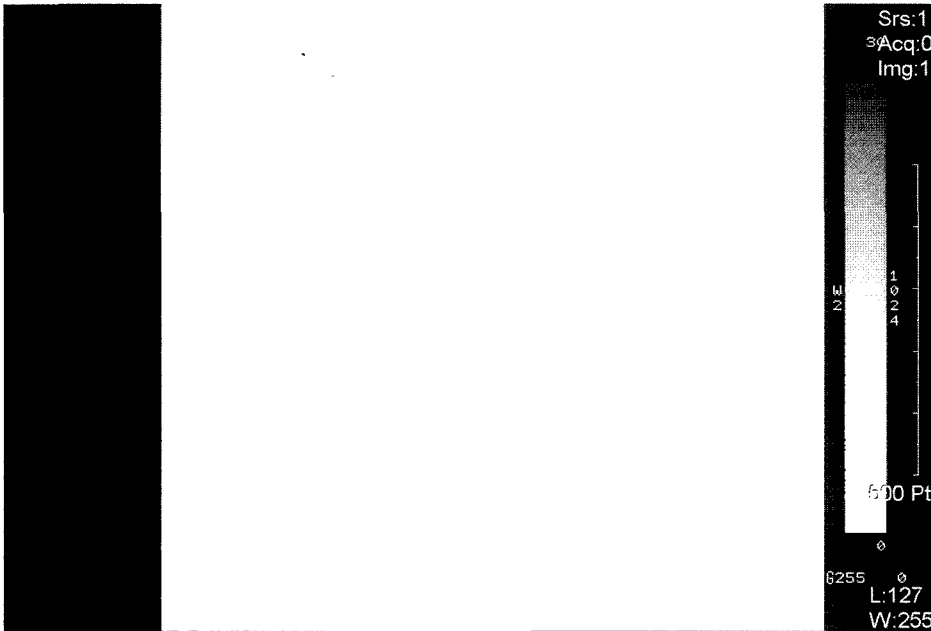


Fig. 5. A scintigram showing increased uptake of isotope in the anterior mandible.

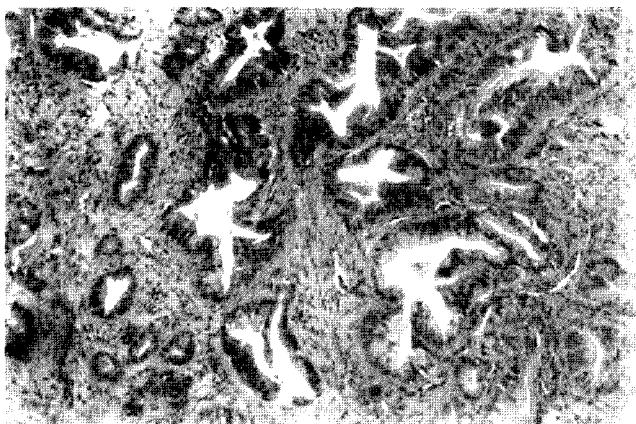


Fig. 6. A photomicrograph of the mandibular lesion showing moderately differentiated neoplastic glands and some cribriform patterns with cellular pleomorphism, desmoplasia, prominent eosinophilic nucleoli and scattered mitoses. (H-E stain; $\times 100$)

in detection, early metastatic spread, and poor prognosis.¹⁰ Meyer and Shklar¹¹ found that when both genders were considered, the most frequent origin of jaw metastases was the breast, followed by the lung and kidney. When men alone considered, the most common primary site was the lung. Lung cancer spreads with great frequency, often widely and at an early stage while the primary growth is very small and undetected.¹² The most frequent sites of metastases are, in decreasing order of frequency, the regional lymph nodes, liver, bones, adrenals, kidneys, brain, heart and pericardium, and pancreas.¹³

Several types of carcinoma can arise from the tissues of the lung. Adenocarcinoma is the most common type of lung cancer, accounting for 30-35% of all cases, which is the most common cause of lung cancer in women and nonsmokers.¹⁴

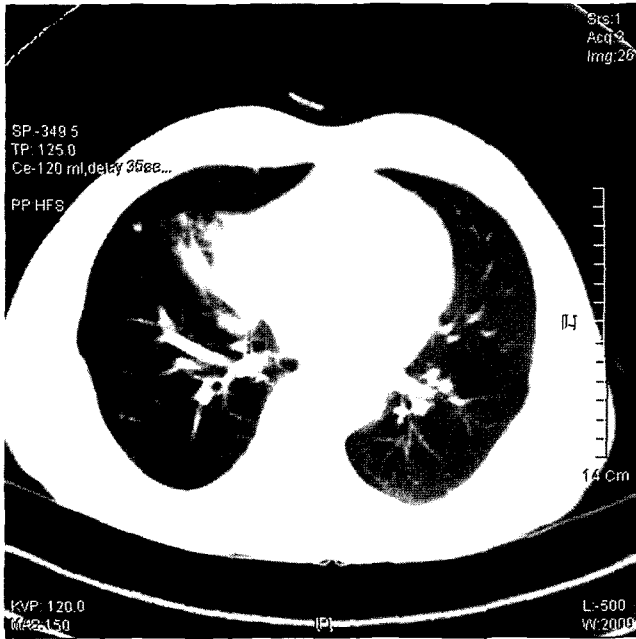


Fig. 7. A chest CT scan showing lobulated contour of mass in the right middle lobe of medial segment, attached to mediastinal pleura.

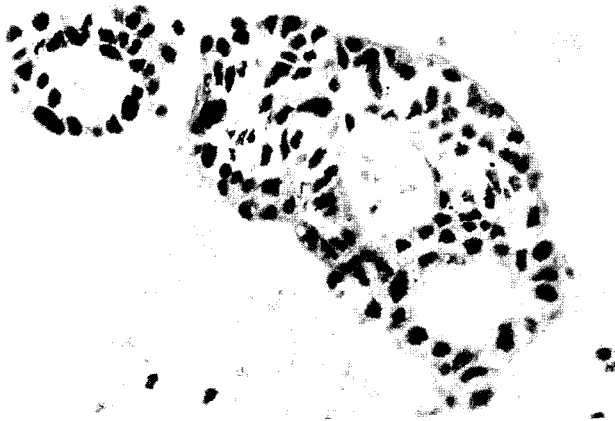


Fig. 8. A photomicrograph of the lung lesion showing an adenocarcinoma. (H-E stain; $\times 100$)

Approximately 40% to 50% of carcinomas metastasizing to the jawbones are adenocarcinoma.^{15,16} The majority of adenocarcinomas occur at the periphery of the lung, and, as a result are often asymptomatic until late in their course. Often adenocarcinoma are discovered on routine chest x-rays or in a primary search for distant metastases. Over half of patients who present with adenocarcinoma are detected by an asymptomatic nodule on a routine chest radiograph.¹⁴

Metastases to the jawbones are found predominantly in the mandible; and metastasis to oral soft tissue are rare.¹³ The site

of predilection is reportedly related to the amount of red bone marrow and the flow rate of the circulating blood.⁶ Most of the red marrow in the jaws is found in the mandibular third molar region—the region most often involved in metastatic spread.¹⁷

Metastatic tumors in the oral cavity have at least two clinical characteristics: they grow rapidly and tend to bleed and ulcerate.¹ Metastases to the jawbones may produce a variety of signs and symptoms, including swelling, pain, looseness of teeth, and paresthesia. In many instances, only swelling is a notable symptom.¹⁸ The pathologic fracture occurs in the more developed lesions, being commonly found in mandibular metastases.¹⁸ Clausen and Poulsen⁹ found 92 reported cases of histologically verified metastatic carcinoma to the jaws and added five of their own. Metastases to the jaws were more common in female patients and were found most often in the midbody and posterior portions of the mandible. The average age of the patients was 55.6 years. The most common symptoms were pain and swelling, but the most significant symptoms was paresthesia of the mandible. In an analysis of 63 histologically verified cases of metastatic carcinoma to the jaws, Sachs¹⁹ 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 regions. Nearly half the cases developed jaw symptoms from metastases before the primary site was discovered. McDaniel et al.²⁰ reported that the most common site of metastasis was the posterior body of the mandible. The average age at occurrence was 51.5 years; 59 per cent of the patient were female. 28 per cent of the patients developed symptoms in the jaws prior to diagnosis of the primary disease.

Metastases in bone show two main radiographic appearances: frank destruction of an area of bone without new bone formation within the lesion or adjacent bone, and an appearance mimicking osteomyelitis characterized by the presence of many areas of destruction.²¹ Although many metastatic lesions are osteolytic and appear as radiolucencies on the radiograph, those of the prostate, breast, etc. may be osteoplastic and appear radiopaque.²¹ Occasionally, metastases may present symptoms but not appear radiographically.¹⁹

In this case, clinical features of dull pain and gingival swelling of the anterior region of the mandible and numbness were found, and radiographic examination showed a large bony defect and pathologic fracture in the mandible at the site of the intraoral lesion. Radiographic skeletal survey revealed no evidence of additional bone lesion. This case presented a diagnostic dilemma as the lesion appeared clinically to be an

osteomyelitis and was therefore treated as such. There was no clinical evidence to suggest that the lesion was a metastasis as the patient was asymptomatic apart from the intraoral lesion. There had been nothing in the patient's history to suggest tumor formation. The possibility of metastatic tumors was not even considered until after the pathologist's report was received. The margin of metastatic tumors in the radiograph shows the same suggestion of infiltration as in primary malignant tumors; when there is only one such lesion, it may not be possible to distinguish whether it is primary or metastatic.²¹ In our case, mandibular anterior teeth were assumed to be the source of the symptoms and were treated endodontically. In a review of 46 cases of metastatic tumor of the jaws, Sachs¹⁹ found that in one third of the patients the teeth were assumed to be the source of the symptoms and were extracted.

Metastatic tumors in jawbones are difficult to recognize for a number of reasons, such as: (1) The lesions are centrally located in the bone. (2) There are very few subjective symptoms, except at a late stage. Sudden onset of anesthesia or paresthesia of the lower lip in elderly patients should be viewed with suspicion. (3) Radiographs usually are nonspecific.¹² Consequently, metastatic invasion has been erroneously diagnosed as various types of cysts, benign tumors, etc., or as lesions of infective and traumatic origin.

Considering the abundant vascularity of the head and neck area, as well as the mechanism and pathways by which malignant tumors spread from one part of the body to another, one would expect a possibility of malignant oral lesions to be metastases. Therefore, metastatic tumors must always be considered in the differential diagnosis of a lesion of the mandible or maxilla. Other pathoses, such as cysts, bone abscesses, osteomyelitis, primary malignant tumors of bone, and bone involvement by systemic disorders (Langerhans cell histiocytosis, multiple myeloma, etc.), may show clinical and radiographic similarities to metastatic lesions, and all should be biopsied in order that they may be correctly diagnosed.^{9,19} The definite diagnosis of a metastatic tumor can only be made histologically in comparison with the features on the primary malignant tumor.

One case of metastatic adenocarcinoma of the mandible is reported. The clinical, radiographic, and microscopic features are discussed and illustrated. The metastatic tumor is an unco-

mon, but the possibility of metastatic lesions masked as infectious disease or benign oral lesions must be kept in mind, and in the diagnosis of a destructive lesion of the mandible or maxilla, metastatic tumor should be considered.

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