Metastatic Prostate Carcinoma to the Mandible: Report of a case

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We report here a rare case of prostate carcinoma which metastasized to the mandible. A 76-year-old male was referred to our hospital due to a complaint of swelling in the left mandible. Roentgenographic findings revealed a radiolucent lesion in the angle of mandible, but scintigraphy did not reveal a specific accumulation in the body except in the mandible. A diagnosis of metastatic prostate carcinoma to the mandible was made through the biopsy specimens from the mandible and from urological examinations. Orchidectomy was performed after the administration of LH-RH agonist and anti-androgenic agent. Elevated blood levels of prostatic specific antigen and γ-seminoprotein were markedly decreased. Furthermore, these therapies were extremely effective not only to the primary lesion but also to the metastatic lesion in the mandible.

Key words: metastatic prostate carcinoma, mandible, PSA

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Introduction

Malignant metastases to the jaws and oral soft tissues represent only 1–2% of all oral malignancies (1). The trend in the recent literature seems to show this percentage to be higher (2). The most common sources of metastases to the jaws are breast, lung, kidney or thyroid gland (3, 4, 5). Prostate carcinoma is also one of the malignant tumors that tend to metastasize to bone. It has been reported that metastatic prostate carcinoma represents 5% of all metastatic tumors in the jaws (6), and the occurrence of prostate carcinoma tends to be increasing in Japan as well as in the United States (7).

We report here a rare case of prostate carcinoma which metastasized to the mandible.

Case Report

A 76-year old man was referred to the Second Department of Oral and Maxillofacial Surgery on May 22, 1995, because of swelling in the left molar region of the mandible. According to the patient, this swelling had been present for one month. The patient had been hospitalized previously for treatment of angina pectoris. The family history was noncontributory. The physical examination showed that he had a hard mass with tenderness, measuring 3 cm in diameter, in the region corresponding to the outer surface of the left angle of mandible. The mass was fixed to the mandible and extended intraorally from the lateral surface of bone to the left molar region of the mandible (Fig.1). Paresthesia in the left lower lip was not observed. Laboratory studies, including complete

Fig.1: Clinical photograph: The mass extended intraorally from the lateral surface of bone to the left molar region of the mandible (arrows).
blood count, urinalysis, blood sugar, urea nitrogen and alkaline phosphatase were all within normal limits. Panoramic radiograph revealed osteolytic lesion which appear as radiolucencies on the left angle of mandible (Fig.2). Computed tomography (CT) revealed tumor growth with bone destruction in the mandible (Fig.3).

Pathology: A biopsy specimen was taken intraorally. Microscopically, neoplastic cells that formed acinar structure and invaded into mandibular bone destructively were identified (Fig.4a). There were many mitoses. These tumor cells had oval and hyperchromatic nuclei or increased nuclei-cytoplasmic ratio. This tumor was interpreted as an unusual type of adenocarcinoma intraorally. Thus, a metastatic tumor of the mandible was suspected.

Hospital course: Although $^{99m}$Tc and $^{67}$Ga scintigraphy were performed to detect a primary site, they did not reveal specific accumulation in any other site except in the mandible. As the patient complained of retention of urea and hematuria during this examination, we consulted with the Department of Urology, Tokushima University, in regard to urological dysfunction. The elevated blood level of prostatic specific antigen (PSA) or $\gamma$-seminoprotein ($\gamma$-Sm) was assayed by enzyme immunoassay as follows: 108.8 ng/ml of PSA (normal level: <3.6 ng/ml) and 68.9 ng/ml of $\gamma$-Sm (normal level: <4.0 ng/ml). Biopsy specimen from the prostate was histopathologically diagnosed as adenocarcinoma similar to that of the mandibular tumor. Furthermore, immunohistochemical examination using a mouse monoclonal antibody to human PSA (dilution 1: 20, DAKO) and ABC system (DAKO) was performed by the avidin-biotin-peroxidase complex method. Expression of PSA was observed in the
biopsy specimens from the mandibular lesion as well as from the prostate tumor (Fig.4b). Therefore, the tumor lesion of mandible was diagnosed as metastasis of prostate carcinoma to the mandible (stage D2). Luteinizing hormone-releasing hormone (LH-RH) agonist (leuprorelin acetate: 3.75 mg/4 weeks) and anti-androgenic agent (flutamide: 375 mg/day) were administrated starting on June 29.

Interestingly, the blood level of PSA or $\gamma$-Sm was markedly decreased in response to the hormonal treatments, and the examinations on July 31 revealed 2.2 ng/ml of PSA and $<1.0$ ng/ml of $\gamma$-Sm. Finally, the patient underwent bilateral orchidectomy on August 14, and had a normal level of PSA or $\gamma$-Sm on August 21 (Fig.5). The patient was discharged on August 30, 1995.

One year after the treatments, the metastatic osteolytic lesion which was found in the angle of mandible before the treatments had almost disappeared on panoramic radiograph (Fig.6). Approximately three years have passed and no evidence of recurrence or of any other metastatic disease has been observed.

Discussion

Although it is well known that prostate carcinoma causes widespread metastases to bones, metastasis to the mandible is extremely rare. Yasuhara et al. reviewed the literature between 1966 and 1994, and found only 13 cases of metastatic prostate carcinoma to the mandible, including 3 cases of Japanese (8).

In general, bone metastasis occurred more often in mandible than in maxilla, and there seems to be a predilection for molar and premolar regions of the mandible (9). This could be attributed to the high content of hematopoietic marrow in the mandible (10). Moreover, a reduced rate of blood flow in the angle of mandible may cause more frequent sedimentation of tumor emboli (11). Most metastatic tumors produced osteolytic lesions in the bone; however, several types of carcinoma, including prostatic, breast and lung cancer, are known to form osteoblastic or sclerotic lesions (12). It was considered that metastatic prostate carcinoma may produce prostatic osteoblastic factor (13).

On the other hand, Clausen (14) or other investigators (1, 3, 15) indicate that the relative frequency of oral metastases was found prior to the recognition of primary lesions. It can be considered that lesions of metastatic tumor in the mandible produced various symptoms, including swelling, pain, bleeding, loosening of teeth and paresthesia. In the present case, the patient also did not have any symptoms concerned with urological dysfunction when he was admitted to our hospital.

Histopathologically, 40–60% of all metastases in the maxillofacial region were adenocarcinoma (15), and occurrence of central adenocarcinoma in the jaws is extremely rare (16). If we encounter central adenocarcinoma in the jaws, we should examine the primary site distant from the jaws.

$^{99}$Tc scintigraphy is a useful technique for detection of multiple bone metastases, but some investigators reported that the examination of blood level of PSA is superior to scintigraphy or all other blood level parameters for prediction of bone metastases in some patients with untreated prostate carcinoma (17,18).

It is well known that most prostate carcinoma respond favorably to estrogen therapy or bilateral orchidectomy, or to both (19). In this present case, the high levels of PSA and $\gamma$-Sm were reduced to a normal range by the administration of anti-androgen and LH-RH agonist as a complete androgen blockade.

It has been reported that 80% of all prostate carcinoma reveal hormone-dependent growth and that hormonal therapies are effective to such tumors, but the rate of recurrence 5 years after the first treatment is extremely high (20). In this instance, although no sign of the local recurrence has been found 3 years after the treatment, long-term follow-up is indispensable.

References


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