Osteosarcoma of the mandible in an aged person

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Abstract
A rare case of an osteosarcoma of the mandible in a 75-year-old person was reported, and the literature on those 75 years and older were reviewed. The clinical, radiological and histopathological findings were similar to those of cases in younger people. In accordance with an increase in the older population, the number of secondary osteosarcomas has increased, but osteosarcoma of the jawbone in those 75 years and older is still very rare.

Introduction
Osteosarcomas of the jawbone are rare neoplasms, accounting for 5-13% of all osteosarcomas.1-8 The estimated incidence of new cases in the jawbone is approximately 1 case in 1.5 million persons per year.1,3,4,8 The characteristic phenomenon of osteosarcoma in the jawbone is that the mean ages of patients (30-40 years) are 1 to 2 decades older than the mean ages of patients with osteosarcomas in the long bones.1-11 Huvos12 reported on osteosarcomas in persons older than 60 years; the incidence of osteosarcomas in the jawbone/all bones (13%) was higher than that in those younger than 60 years (6%). Nevertheless, there are few cases in the older person. The present article describes a case of osteosarcoma of the mandible in a 75-year-old person with clinical, radiological and histological findings. The literature on those 75 years and older was reviewed and discussed.

Case report
A 75-year-old man had extreme mobility of the right lower second molar and a dull pain in the right posterior mandible for two weeks and had received antimicrobial therapy from the examining dentist for 10 days. Since the symptom did not significantly change, he was referred to our department.

Clinical examination revealed a little expansion of the buccal cortex at the apices of the right lower second and third molar areas with minimal pain on palpation. The oral mucosa showed a little swelling by expansion, some erythema, and a fistula on the buccal gingiva at the second molar. Pressure on the fistula revealed pus. The first and second molars responded to stimulation with the electrical pulp tester. Two mobile and tender lymph nodes were palpable in the right submandibular region. A single lymph node was palpated in the left submandibular region, which was also mobile but not tender. The patient denied both paresthesia and anesthesia in the lower right lip.

Radiographic appearance showed an osteosclerotic and osteolytic area at the posterior of the second molar (Fig. 1).

Fig. 1. Panoramic radiograph showed bone formation and osteolytic bone resorption in molar region.

Osteomyelitis was clinically suspected, and a surgical biopsy was performed. A fragment of a firm soft tissue following the extraction of the second molar was obtained from the socket. Histopathologic result indicated osteoblastoma. However, since gradual increased swelling and higher alkaline phosphatase values were observed (the highest value was 66 U/L; normal value was 22-48 U/L),
osteoarcoma was clinically suspected (Fig. 2).

The enucleation and excision of the tumor were performed. The tumor within the bone was easily enucleated after extraction of the first molar. The extension of the tumor into or along the mandibular canal was not found, and the neurovascular bundle was pressed toward the bottom. Contrarily, the removal of the tumor, which extended from an approximately 1.5x1 cm fenestration of the lingual cortex slightly below the apices of the first and second molars into the oral floor, was difficult, and the tumor was incised with the adjacent soft tissues. Histopathological examination from the gross specimen was osteosarcoma. A hemimandiblectomy was performed with removal of the right submandibular gland and lymph nodes. Radiation and chemotherapy were given as subsequent treatment. Although recurrence and metastasis of the osteosarcoma were not found, the patient died of myocardial infection 7 months after the surgery.

Microscopic examination revealed that the tumor cells were composed of atypical osteoblast-like cells and their less differentiated precursors with osteoid and bone formation. Osteosarcoma was the osteoblastic type (Figs 3 and 4).

Discussion

The older population of Japan is already substantial and continues to grow. In 2000, persons 65 years and older accounted for 17.3% of the Japanese population according to the Report of the Aging Center of Japan, 2001. Although
Osteosarcoma occurs generally in young persons, the growing older population increases the number of elderly cases. However, in spite of the increase of these cases, osteosarcoma in those 75 years and older is still very rare. The present case exhibited rapid growth, bony swelling, dull pain and a higher alkaline phosphatase value. In general, these finding were common in the literature, but the higher alkaline phosphatase value was not and was found in approximately one-third of the cases. The tumor was in the mandibular body and in the common region.

Radiographically, osteosarcoma is classified into lytic, sclerotic and mixed (sclerosis with lytic lacunae of various sizes) types. The present case was the mixed type and a predominant type in the mandible. Sunray appearance was seen in 30% of the cases, but was not found in the present case. The root resorption of the permanent tooth that Finkelstein reported did not occur in the present case. Also, the widened periodontal ligament space, which is a typical observation of early osteosarcoma of the jaws, apparently caused by invasion of the osteosarcoma into periodontal ligament, was not observed.

Histologically, osteosarcoma is mainly classified into osteoblastic, chondroblastic and fibroblastic types. Osteoblastic and chondroblastic types are predominant, and the present case was the osteoblastic type.

As we have already mentioned, the present case was not different from the cases of those younger.

Twenty-one reports on primary osteosarcomas of the jawbone in which more than 13 cases were listed were reviewed for the characteristic findings of those 75 years and older. Secondary osteosarcomas arising in association with bone abnormalities, such as Paget’s disease and fibrous dysplasia, and those developing postradiation were excluded. Age, sex and site were minimum criteria. The cases of those 75 years and older were not in 13 reports; first authors (number of cases and oldest age) are listed from the earliest report to the latest: Kragh et al. (n=44, 62), Garrington et al. (n=56, 64), Roca et al. (n=20, 67), Slootweg and Muller (n=18, 65), Ryan et al. (n=24, 69), Ajagbe et al. (n=21, 47), Lee et al. (n=24, 62), Goepfert et al. (n=55, 73), Herrmann and Zoller (n=24, 74), Vege et al. (n=30, 61), Bertoni et al. (n=28, 68), Mark et al. (n=18, 58) and Wang (n=89, 63). The cases of those 75 years and older were found in 5 reports but were insufficient: Caron et al. (n=43, 82), Clark et al. (n=66, 76), Tanzawa et al. (n=114, 82), Delgado et al. (n=23, 75) and August et al. (n=30, 84). Only three cases were sufficient: Russ and Jesse (n=30, 76), Oda et al. (n=13, 75) and Mardinger et al. (n=14, 29).

Table 1. Osteosarcoma of jawbone in those 75 years and older.

<table>
<thead>
<tr>
<th>Author</th>
<th>Age</th>
<th>Sex</th>
<th>Symptoms type</th>
<th>Pathologic surgery</th>
<th>Type of Radiation</th>
<th>Chemotherapy</th>
<th>Clinical status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandible Ishibashi(31)</td>
<td>75</td>
<td>F</td>
<td>Painless swelling</td>
<td>Paro</td>
<td>-</td>
<td>-</td>
<td>DOD</td>
</tr>
<tr>
<td>Oda(28)</td>
<td>75</td>
<td>M</td>
<td>NA</td>
<td>Osteo</td>
<td>Hemi</td>
<td>+</td>
<td>NED</td>
</tr>
<tr>
<td>Present case</td>
<td>75</td>
<td>M</td>
<td>Swelling</td>
<td>Osteo</td>
<td>Hemi</td>
<td>+</td>
<td>DND</td>
</tr>
<tr>
<td>Maxilla Sato(30)</td>
<td>75</td>
<td>F</td>
<td>Painless swelling</td>
<td>Chondro</td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Russ(27)</td>
<td>76</td>
<td>F</td>
<td>NA</td>
<td>NA</td>
<td>Maxi</td>
<td>-</td>
<td>DOD</td>
</tr>
<tr>
<td>Mardinger29</td>
<td>78</td>
<td>M</td>
<td>Painless swelling</td>
<td>Fibro</td>
<td>Maxi</td>
<td>+</td>
<td>DOD</td>
</tr>
</tbody>
</table>

Abbreviations: F, female; M, male; Paro, parosteal; Osteo, osteoblastic; Chondro, chondroblastic; Fibro, fibroblastic; NA, not available; -, not done; +, done; Hemi, hemimandibulectomy; Maxi, maxillectomy; NED, alive no evidence of osteosarcoma; DND, died with no evidence of osteosarcoma; DOD, died of osteosarcoma.
78). Two case reports30,31 were added. Six cases including the present case are summarized in Table 1. The highest age was 78 years. Pathologic types in the mandible were osteoblastic in 2 cases, and one case was juxtacortical. Juxtacortical osteosarcoma arises at the periphery of bone at the periosteal surface and classified as either parosteal or periosteal type. No treatment was performed in 2 out of 26 cases due to many disorders. In 3 out of 5 cases, the persons died of osteosarcoma. Lack of success in the treatment of those 75 years and older affected by osteosarcoma was also one of the results. Since the growing older population may further increase the occurrence of osteosarcoma in the elderly, analysis of older cases might be essential for successful treatment.

Conclusion
A rare case of a 75-year-old person with osteosarcoma in the mandible was reported. The clinical, radiological and histological findings were similar to cases of those younger. Though the older population continues to grow, primary and secondary osteosarcomas of the jawbone are still rare in those 75 years and older.

References
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