

A Rare Case of Malignant Melanoma of the Mandible: CT and MRI Findings

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Malignant melanoma of the mandibular gingiva is extremely rare. It is a malignant tumour of melanocytes or their precursor cells, and often misinterpreted as a benign pigmented process. A few reports have described computed tomography (CT) and magnetic resonance imaging (MRI) findings of malignant melanoma in the oral cavity. We report a rare case of malignant melanoma of the mandible and the related CT and MRI findings. Soft tissue algorithm contrast-enhanced CT showed an expansile mass and irregular destruction of alveolar bone in the right side of the mandibular molar area. MR images showed an enhancing mass and the tumour had a low to intermediate signal intensity and a high-signal intensity. Soft tissue algorithm contrast-enhanced CT and MR images showed lymphadenopathy involving the submandibular lymph nodes. Histopathological examination confirmed the diagnosis of malignant melanoma.

Key words: CT, mandible, melanoma, MRI, tumour

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Malignant melanoma of the oral cavity is extremely rare¹⁻³. It is a malignant tumour of melanocytes or their precursor cells, and often misinterpreted as a benign pigmented process^{4,5}. The prognosis of this entity is very poor^{6,7}. Oral malignant melanoma is aggressive neoplasm, which accounts for less than 0.5% of all melanomas commonly affecting palate and maxillary gingiva whereas mandible, tongue, buccal mucosa and upper and lower lip are less frequently affected⁸⁻¹⁰. A few reports have described imaging findings of malignant melanoma of the oral cavity^{1,2}, however the computed tomography (CT) and magnetic resonance imaging (MRI) of malignant melanoma of mandibular gingiva have not been fully described. We report a rare case of malignant melanoma of the mandible and the related CT and MRI findings.

Case report

A 51-year-old man presented with a swelling on the right side of the mandible that had developed over 6 months. On clinical examination, the presenting features of the tumour were a soft tissue mass of 4.0 × 5.5 cm in size. Its appearance varied from grey to black, soft to firm. The tumour bled easily, was lobulated and had a rubbery consistency. He had no significant past medical or family history.

Panoramic imaging showed destruction of bone in the right side of the mandibular molar area (Fig 1a). Axial soft tissue algorithm contrast-enhanced CT showed an expansile mass that extended buccally and lingually in the right mandible, heterogeneous enhancement (Fig 1b). Sagittal bone tissue algorithm CT showed irregular destruction of alveolar bone in the right side of the mandibular molar area (Fig 1c). MRI appearance was that of a homogeneous expansile mass of intermediate-signal intensity on T1-weighted images (Fig 2a). Furthermore, a part of the melanoma had high T1-weighted signal intensity. T1-weighted, contrast-enhanced MRI showed an enhancing mass (Fig 2b). T2-weighted MRI showed that the tumour had a low to intermediate signal intensity and a high-signal intensity

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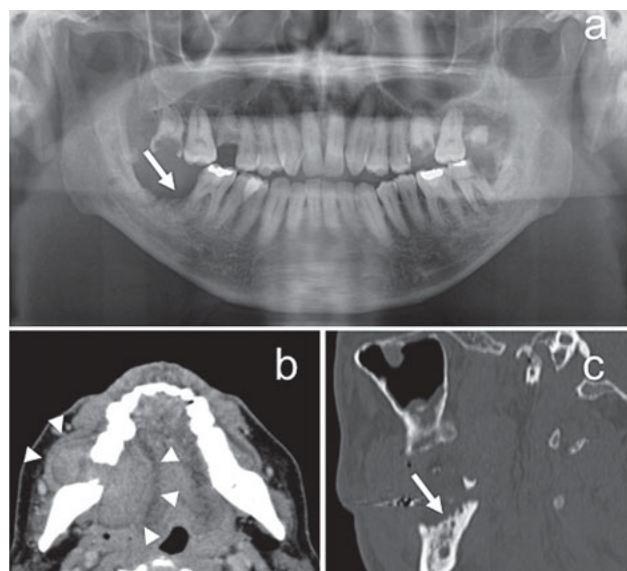


Fig 1 Panoramic image (a) showed destruction of bone in the right side of the mandibular molar area (arrow). Axial (b) soft tissue algorithm contrast-enhanced CT showed an expansile mass that extended buccally and lingually in the right mandible, heterogeneous enhancement (arrowheads). Sagittal bone tissue algorithm CT (c) showed irregular destruction of alveolar bone in the right side of the mandibular molar area (arrow).

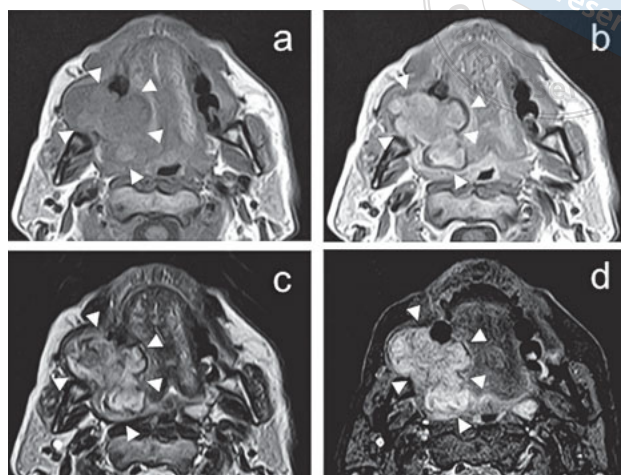


Fig 2 Axial MR imaging appearance (a) was that of a homogeneous expansile mass of intermediate signal intensity on T1-weighted image (arrowheads). Furthermore, a part of the melanoma had high T1-weighted signal intensity. Axial T1-weighted, contrast-enhanced MR image (b) showed an enhancing mass (arrowheads). Axial T2-weighted MR image (c) showed that the tumour had a low to intermediate signal intensity and a high-signal intensity (arrowheads). Axial short TI inversion recovery (STIR) images (d) showed heterogeneous high signal intensity (arrowheads).

(Fig 2c). Short TI inversion recovery (STIR) images showed heterogeneous high-signal intensity (Fig 2d). Furthermore, soft tissue algorithm contrast-enhanced CT and MR images showed lymphadenopathy involving the submandibular lymph nodes (Figs 3, 4a and 4b).

A partial biopsy of the mandibular gingiva was performed. Histopathological examination revealed the tumour cells had a spindle shape and atypical nuclei containing distinct nucleoli (Fig 4c). The tumour

cells were positive for Melanin Bleach technique. Immunohistochemical studies showed S-100 (Fig 4d) and Melan A (Fig 4e) were positive. Histopathological diagnosis was malignant melanoma. A segmental mandibulectomy with radical neck dissection was performed under general anaesthesia. While the oral and neck lesions did not recur, the patient developed pancreatic metastases 3 years later and as a consequence, was transferred to another hospital for chemotherapy.

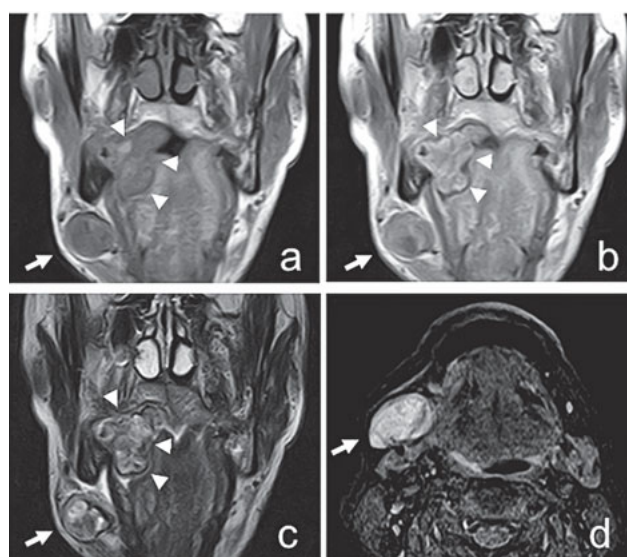


Fig 3 Coronal MR imaging appearance (a) was that of a homogeneous expansile mass of intermediate signal intensity on T1-weighted image (arrowheads). Furthermore, a part of the melanoma had high T1-weighted signal intensity. MR image showed lymphadenopathy involving the submandibular lymph nodes (arrow). Coronal T1-weighted, contrast-enhanced MR image (b) showed an enhancing mass (arrowheads). MR image showed lymphadenopathy involving the submandibular lymph nodes (arrow). Coronal T2-weighted MR image (c) showed that the tumour had a low to intermediate signal intensity and a high-signal intensity (arrowheads). MR image showed lymphadenopathy involving the submandibular lymph nodes (arrow). Axial short TI inversion recovery (STIR) images (d) showed lymphadenopathy involving the submandibular lymph nodes (arrow).

Discussion

Malignant melanoma of the mandibular gingiva is extremely rare¹⁻³. McLean et al¹¹ reviewed 22 cases of primary sinonasal melanoma and eight cases of oral cavity melanoma at their institution. They showed that the mean age was 67.5 years, with a range from 32 to 85 years, and 60% of cases were male. Smith et al¹² identified 46 cases of both primary and metastatic melanoma to the oral cavity at their institution. They showed that the primary cases included a total of 20 females and 12 males, with an average age of 66.7 (range 27–95), and 22 of the 32 primary cases (68.8%) were located in the maxillary mucosa, five in the mandibular mucosa or bone, and five in other locations. In this article, we present a case of malignant melanoma of mandibular gingiva in a 51-year-old male.

Regarding intraoral and panoramic radiographs, Rathore et al³ reported that a panoramic radiograph showed bone loss in relation to mandibular anterior teeth. Gondivkar et al¹⁰ indicated that the intraoral periapical radiograph of the region of the maxillary left first and second molar revealed irregular widening of the periodontal ligament space around the first molar, suggesting that a malignant process involved the periodontal ligament space. Ali et al² indicated that a panoramic radiograph showed an ill-defined radiolucency in the left mandibular angle associated with pathological fracture. In our case, the panoramic image showed destruction of bone in the right side of the mandibular molar area.

Regarding CT, Rathore et al³ reported that CT images showed a cortical bone destruction, soft tissues expansion and a necrotic left jugulodigastric lymph node. Thomas et al⁷ showed that the CT scan revealed an enhancing infiltrative soft tissue mass causing bilateral, bony erosion of the hard palate and bilateral submandibular lymphadenopathy giving an impression of a soft tissue growth over the hard palate. In this study, CT showed an expansile mass that extended buccally and lingually in the right mandible, heterogeneous enhancement and irregular destruction of alveolar bone in the right side of the mandibular molar area. Ogura et al¹³ indicated mandibular bone invasion by gingival squamous cell carcinoma on CT images. We showed that CT findings of our case were similar to squamous cell carcinoma. Furthermore, we consider that melanoma tend to enhance well on contrast-enhanced CT, because of their rich vascular network.

Regarding MRI, Hayashi et al¹ indicated that the gingival mass was represented by high-signal intensity on both T1-weighted and fat-saturated T1-weighted images, and intermediate intensity on fat-saturated

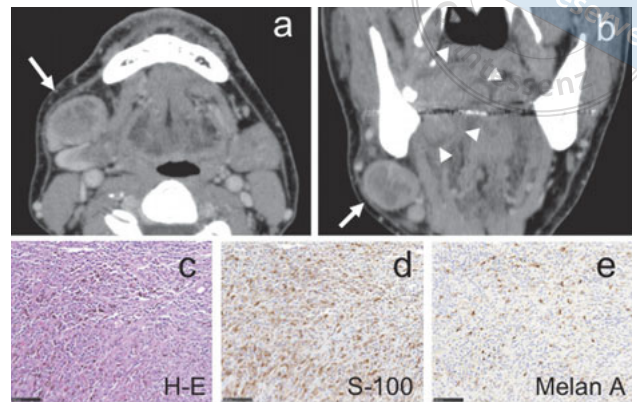


Fig 4 Axial (a) and coronal (b) soft tissue algorithm contrast-enhanced CT showed lymphadenopathy involving the submandibular lymph nodes (arrow). Coronal (b) soft tissue algorithm contrast-enhanced CT showed an expansile mass that extended buccally and lingually in the right mandible, heterogeneous enhancement (arrowheads). Histopathological examination (c-e): The tumour cells had a spindle shape and atypical nuclei containing distinct nucleoli (c). The tumour cells were positive for S-100 (d) and Melan A (e) with Melanin Bleach technique. Bar: 100 µm

T1-weighted images. On fat-saturated images, the tumour was demonstrated more clearly than on conventional T1-weighted images. Fat-saturated post-contrast T1-weighted images suggested that the tumour was invading the cortical and alveolar bones. In our case, MRI appearance was that of a homogeneous expansile mass of intermediate signal intensity on T1-weighted image. Furthermore, a part of the melanoma had high T1-weighted signal intensity. T1-weighted, contrast-enhanced MRI showed an enhancing mass. Uchiyama et al¹⁴ indicated that the MRI findings of malignant melanomas in the head and neck region are characterised by hyperintense T1-weighted images and intermediate to hypointense T2-weighted images, owing to its paramagnetic effects. Ishida et al¹⁵ suggest that stable free radicals within melanin pigments are paramagnetic and responsible for decreased T1 and T2 relaxation times. We consider that melanomas enhance well on contrast-enhanced MR because of their rich vascular network and melanomas have high T1-weighted signal intensity primarily because of the presence of haemorrhage and paramagnetic melanin.

Conflicts of interest

The authors reported no conflicts of interest related to this study.

Author contribution

Dr Ichiro OGURA, designed the work and acquired the case data; Dr Yoshihiko SASAKI approved the final revised manuscript; Dr Ayako KAMETA analysed and interpreted the radiological data; Dr Mikiko SUE prepared the manuscript; Dr Takaaki ODA revised the manuscript.

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