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Lung Carcinoma Presenting as Bilateral Metastases in the Mandibular Gingivae: A Case Report and Literature Review

Abstract: This case report describes the rare presentation of lung carcinoma as bilateral masses affecting the mandibular gingivae. Although metastatic disease to the mouth is rare, accounting for only 1% of oral malignancies, it is essential to ensure that the presence of cancer is included in any differential diagnosis.

CPD/Clinical Relevance: All oral abnormalities persisting for longer than 3 weeks should be referred urgently for specialist assessment and biopsy.

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Metastasis can have several forms of clinical presentation and, in this case, bilateral gingival masses posed a diagnostic dilemma. Bilateral gingival metastases are extremely rare which can often lead to erroneous diagnosis. All oral abnormalities persisting for longer than 3 weeks should be referred urgently for specialist assessment and need for biopsy.¹ Metastatic dissemination to the oral cavity

is rare and accounts for about 1% of oral malignancies.² However, these malignancies are of great significance since, in 20% of patients, they may be the first indication of an asymptomatic primary tumour elsewhere in the body. The most frequently affected sites are the mandibular molar regions, followed by the gingivae.³ With respect to soft tissue disease, the most common site for metastasis is the attached gingiva (57%), followed by the tongue (27%), tonsil (8%), palate (4%), lip (3%), buccal mucosa (1%) and floor of mouth (<1%).³ The most frequent primary malignancies presenting as oral metastases are the lung, kidney, liver and prostate for men, and breast, genitalia, kidney and colon-rectum for women.²

The pathogenesis of metastatic spread of tumours in the oral cavity is not clear. Most cases of carcinoma spread via the lymphatics or haematogenous routes. The mechanism of most oropharyngeal metastases is through haematogenous

dissemination. Understandably, the liver and the lungs are the most frequently involved organs in haematogenous dissemination.⁵ Several primary malignancies, particularly from the breast, prostate, lungs and kidneys, tend to metastasize to bone. Within the skeleton, bones with red marrow are the most likely sites for metastatic deposits. In contrast, jawbones have little active marrow, particularly in elderly persons. However, remnants of haematopoietic active marrow can be detected in the posterior mandible and these haematopoietically active sites attract metastatic tumour cells.⁶ Metastatic spread to the gingiva remains unclear, but spreading tumour cells may be attracted by the presence of teeth with chronically inflamed gingiva and rich capillary networks, as in the case reported here.⁷

Case report

A 68-year-old man attended the oral and maxillofacial department, following referral by his dentist, with an 8-week history of bilateral

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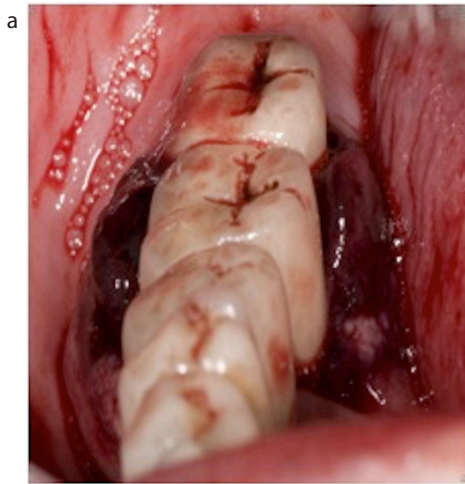


Figure 1. Ulcerated gingival masses **(a)** right mandible, measuring 1x1 cm and **(b)** left mandible, measuring 3x1 cm.

symptoms in the lower jaw. He reported that his gums were swollen, tender and had been bleeding spontaneously. The swellings had not changed in size after an initial growth during the first 4 weeks. The patient had attended his dentist complaining of these symptoms and he believed them to be related to his dental implants. The patient did not report any significant weight loss, changes to appetite or pain.

Medically, he was fit and well, not on any regular medication, and had no known drug allergies. The patient did not consume alcohol but was an ex-smoker with a 40-pack year history. He reported that he had cut down to four cigarettes per day 12 months previously and then stopped entirely 6 months prior



Figure 2. An orthopantomograph showing six osseointegrated implants in the mandible with angular bony defects.



Figure 3. PET-CT showing high metabolic activity in the upper lobe of the right lung.

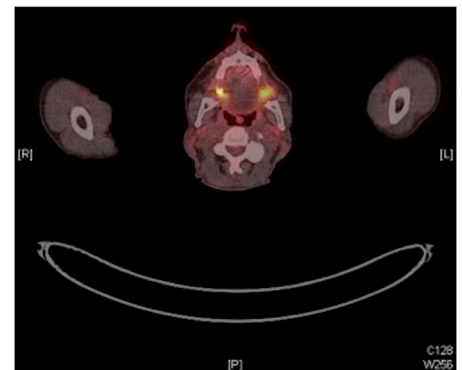


Figure 4. PET-CT revealing high uptake around the mandibular alveoli.

to his presentation. He was retired from the building trade.

The patient was a regular dental attender. He had travelled abroad 15 years previously to have dental implants placed and restorative work in both the maxilla and mandible. There had been no known dental problems since that time.

Extra-oral examination revealed no abnormal cervical lymph nodes. Intra-orally, there was an ulcerated mass on the right mandibular alveolus measuring 1x1 cm in diameter, primarily around the lower right first molar (Figure 1a). There was a similar mass of larger size on the left mandibular alveolus involving the lingual and buccal aspect of the mandible, extending from the lower left first premolar to the lower left second molar. This mass measured 3x1 cm in diameter and spontaneously bled during examination (Figure 1b). Although the implant-retained four-unit conventional bridge from the first premolar to the second molar was not mobile,

periodontal probing revealed pockets greater than 9 mm.

An orthopantomogram performed at the initial consultation showed the presence of six osseointegrated implants in the mandible, three on each side, and six in the maxilla (Figure 2). There was considerable bone loss, including vertical angular defects, around the implants especially in the left body of the mandible; however, there was no abnormal bony resorption adjacent to the abnormalities.

The differential diagnosis upon initial examination was that of peri-implantitis, granulomatous disease and malignancy; either primary or secondary metastases. An urgent incisional biopsy of the mandibular lesions was performed under local anaesthesia to confirm a diagnosis. The subsequent histopathological report suggested a high grade, poorly differentiated carcinoma, possibly large cell or neuroendocrine, and probably metastatic in origin. Although

thyroid transcription factor 1 expression was absent, origin from a lung cancer could not be excluded.

The patient underwent cross-sectional image staging with magnetic resonance imaging (MRI) of the head and neck, computed tomography (CT) of the thorax and subsequent full body positron emission tomography–computed tomography (PET-CT). The MRI of the head and neck highlighted bilateral pathological changes in the tissues overlying the right and left mandibular alveoli. There was also bilateral pathological cervical lymphadenopathy, with necrotic changes, largest within right level IIa. The CT thorax showed a 5-cm diameter mass in the right upper lung lobe, invading the chest wall, without obvious rib erosion.

The PET-CT detected an area of high metabolic activity in the right upper lobe, suspicious of a primary lung tumour (Figure 3). There was also high uptake in the bilateral adrenal glands and around the mandibular alveoli (Figure 4). There was also suspicious cervical, left supraclavicular and right hilar region uptake. Considering the oral histology report and PET-CT findings, it was concluded that this was a lung primary staged as T2aN3M1b.

Following discussion at the head and neck multidisciplinary team meeting (MDT), the patient was referred to the lung MDT, where a diagnosis of a primary lung carcinoma with secondary metastases to bilateral adrenal glands, hilar and cervical lymph nodes and mandibular gingivae/alveoli was confirmed.

A treatment plan was formulated by the lung oncologist who recommended chemotherapy and palliative radiotherapy if the masses in the mandible became painful. There was no formal oral and maxillofacial follow-up planned.

Discussion

Metastatic spread of malignancy to the oral cavity, although rare, is an important clinical phenomenon. The bilateral presentation described in this case is unusual. The presence of the mandibular dental implants may have resulted in an initial delay in the presentation of the patient to his dentist, especially considering he was not experiencing any pain. A suspected diagnosis of severe peri-implantitis could not be excluded until an incisional biopsy was performed to ascertain the histopathology of the masses.

The clinical presentation of metastatic tumours in the gingivae differs from primary gingival carcinoma. Metastases resemble benign inflammatory changes, such as hyperplasia, pyogenic granuloma and fibrous epulis, and diagnosis can often be delayed. Primary gingival carcinoma usually presents with ulceration, which raises suspicion of malignancy.⁸ In this case, although the masses were suspicious, bilateral primary mandibular malignancies are extremely rare and therefore, metastases were more likely.

A literature review was conducted to determine the reported incidence of primary lung carcinoma presenting as bilateral mandibular masses and revealed that the majority of cases of lung metastases to the oral cavity occur after initial diagnosis of the primary carcinoma. The initial presentation as changes in the mouth is extremely rare.⁸ Furthermore, all reported cases in the literature described a unilateral presentation to the gingiva. This case appears to be the only one involving bilateral metastases to the mandibular gingivae from a lung carcinoma.^{4,8,10–16}

On initial presentation, the mucosal abnormalities in this case appeared exophytic, highly vascularized, and haemorrhagic, which is a characteristic appearance for gingival metastases.¹⁶ Gingival metastatic lesions cause pain, easy bleeding, halitosis, and interfere with eating. Therefore, palliative treatment for the relief of these symptoms is necessary.¹² The main treatment modalities include radiation therapy or chemotherapy. Surgical treatment is generally reserved for oral metastatic tumors that interfere with function or have potential for obstructing the airway.² Average survival time for metastatic lung tumours is 4 months to 1-year, with a maximum survival rate of 5 years.¹¹

Conclusion

This case reinforces the importance of a differential diagnosis that includes metastases when assessing abnormalities in the oral cavity.

Compliance with Ethical Standards

Conflict of Interest: The authors declare that they have no conflict of interest.

Informed Consent: Informed consent was obtained from all individual participants included in the article.

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