CASE REPORT

Melanoma Metastatic to the Mandible: Symptoms Precede Imaging Findings

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Abstract

Background Malignant melanoma is an aggressive and unpredictable cancer with the propensity for widespread metastasis. Whilst metastatic spread to the axial skeleton is relatively common, metastasis to the jaws is rarely reported and the optimal approach to investigation and management is yet to be defined.

Case presentation A 58-year-old woman presented with dental pain, swelling and mental neuropathy on a background of an excised cutaneous melanoma. Early radiological investigations showed non-specific osteolysis despite strong clinical findings. It was not until later that magnetic resonance imaging showed changes consistent with metastatic disease. Dental extraction and biopsy confirmed the diagnosis of metastatic melanoma to the mandible.

Conclusion Metastatic melanoma to the mandible is a rare phenomenon which may arise many years following treatment of the cutaneous primary. This case demonstrates the difficulties in early diagnosis as symptoms preceded radiographic findings using high-resolution modalities. Earlier use of magnetic resonance imaging with or without the use of bone scintigraphy may provide the sensitivity required for early identification of metastatic disease in the mandible.

Keywords Melanoma · Metastatic · Malignant · Jaws · Mandible

Introduction

Malignant melanoma is an aggressive and unpredictable cancer with the propensity for widespread metastasis. Whilst metastatic spread to the axial skeleton is relatively common, metastasis to the jaws is rarely reported and usually represents late stage disease. We report a case of a patient presenting with pain, swelling and mental neuropathy on a background of an excised cutaneous melanoma in whom radiological findings trailed clinical progress. The purpose of this paper is to discuss the presentation and investigation of metastatic melanoma to the jaws (Table 1).

Report of a Case

A 58-year-old woman presented to her general dentist complaining of pain from the lower left first molar and numbness in the distribution of the left inferior alveolar nerve, which was diagnosed as a dental abscess and treated with root canal therapy. Three months later there was recurrence and progression of symptoms. Attempts to readdress the infection failed raising suspicion of a non-odontogenic cause. She was then referred to the Oral and Maxillofacial Surgery Unit where our examination confirmed left lower lip paraesthesia, with all other examinations being unremarkable. Panoramic radiography (Fig. 1a) showed a 1-cm well-defined radiolucent lesion associated with the roots of the left lower first molar. Computed tomography confirmed the presence of an osteolytic lesion,

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Table 1 Analysis of clinical cases of metastatic melanoma to the jaws

Case	ADx, sex	Primary site	Clark level	Breslow thickness (mm)	Disease free (month)	Mandibular site	Clinical features	Radiology	Treatment	Survival from Dx (months)
Aisenberg 1956	62, F	Cutaneous-axilla	Ns	Ns	1	Right body	Toothache	Radiolucency	Ns	1
Hurwitz 1971	53, M	Cutaneous-left leg	Ns	Ns	42	Left angle	Mass, pain, IAN paraesthesia, tooth mobility	Poorly defined radiolucency	Ns	1
Samit 1978	28, M	Cutaneous-Chest wall	Ns	Ns	84	Right posterior	Pain, tooth mobility	Diffuse periapical radiolucency	Extraction, Primary radiotherapy	19
Bucin 1982	61, F	Right eye	Ns	Ns	84	Left body	Swelling, pain, IAN anaesthesia	Poorly defined radiolucency	Radiotherapy	<11
Myall 1983	30, F	Cutaneous-chest wall	III	Ns	36	Right body, angle	IAN paraesthesia, tooth mobility, bony expansion, RHS whole body weakness	Irregularly defined radiolucency	Radiotherapy	Few months
McNelis 1985	53, F	Left eye	Ns	Ns	504	Left body	Asymptomatic	Radiolucent lesion	Hemimandibulectomy, Adjuvant chemotherapy	Ns
Zachariades 1989	53, M	Right eye	Ns	Ns	12	Right body, angle	Swelling/mass	Radiolucency	Radiotherapy	Ns
Aniceto 1990	48, F	Cutaneous-back	Ns	Ns	16	Left angle, ramus	Swelling, lip numbness, tooth mobility	Radiolucency	Immunotherapy	5
Patton 1994	38, M	Cutaneous-left finger	IV	Ns	111.6	Right body	Ns	Ns	Surgical resection, chemotherapy, immunotherapy	10.8
Patton 1994	58, M	Cutaneous-Left calf	V	10	28.8	Left angle	Ns	Ns	Chemotherapy, radiotherapy	3.6
Nortje 1996	43, M	Cutaneous-nose	Ns	Ns	24	Left angle	Pain, TMD	Ill-defined Destructive lesion	Chemotherapy	6
Santamaria 1997	55, M	Unknown	Ns	Ns	Ns	Right mandibular angle	Bleeding extraction site, previous episodic pain, IAN paraesthesia	Radiolucent lesion	Segmental mandibulectomy, right radical neck dissection	40
Perez 2005	64, M	Cutaneous-heel	Ns	Ns	24	Right body	Pain, bony expansion, supraclavicular lymphadenopathy	Demarcated radiolucency	Ns	4
Rivera 2010	56, M	Cutaneous-back	Ns	1.6	28	Anterior	Pain	Periapical radiolucency, increased FDG marking	Segmental resection	A > 54
Kammerer 2011	68, M	Cutaneous-left scapula	Ns	Ns	30	Left posterior	Exophytic mass, IAN paraesthesia	Inhomogeneous circumscribed osteolytic lesion	Palliative resection, selective neck dissection	3.25

Table 1 continued

Case	ADx, sex	Primary site	Clark level	Breslow thickness (mm)	Disease free (month)	Mandibular site	Clinical features	Radiology	Treatment	Survival from Dx (months)
Morimoto 2013	42, F	Lung	Ns	Ns	N/A	Condyle	Pain in the left TMJ, stiffness	Radiolucency	Chemotherapy, radiation to the mandibular condyle	10
Present study	58, F	Cutaneous-left lower back	IV	7.6	110	Left body, angle	Lip numbness, tooth mobility, toothache	Well-defined radiolucency	Palliative extraction	1.5

ADx Age at diagnosis, Ns not stated

however, showed no evidence of osteomyelitis or focal abnormality. The initial impression was that this was an iatrogenic nerve injury, however, the patient reported a history of a Clark level 5 cutaneous amelanotic melanoma of the lower back 9 years previously. This had been widely excised and the treatment considered curative.

She proceeded to undergo staging CT examination which revealed lung lesions suspicious for metastatic disease. Nuclear medicine scans also found widespread metastatic disease. Nine weeks later her jaw symptoms worsened with left mandibular dysesthesia and molar mobility. MRI imaging (Fig. 1b) showed extensive marrow infiltration and perforation of the lingual plate in the angle of the mandible. Extraction of the left mandibular molar and biopsy (Fig. 2) of the associated lesion confirmed the presence of malignant melanoma in the mandible. Following diagnosis, her condition rapidly declined with increasing nausea, vomiting and dehydration. She declined palliative treatments and died 6 weeks following the confirmation of metastatic melanoma to her jaw.

Discussion

The oral region is a recognised site of metastatic disease most commonly from adenocarcinomas. Malignant melanoma metastasising to the mandible is a rare phenomenon with few reported cases in the literature. Involvement of the jaw bones from melanoma of the lower body, as in this case, is thought to disseminate through vascular channels via Batson's vertebral venous plexus [1]. They most commonly involve the posterior mandible due to the larger red bone marrow volume and peculiar vascularisation providing favourable sites for implantation of metastatic emboli [2].

In the 16 cases identified, the primary sites of malignant melanoma were the skin in a wide range of sites including those of the lower body. Other sites included the eyes and lungs. The duration from initial diagnosis to mandibular metastasis varied widely, ranging from 1 month to 42 years (mean 6.3 years). The most common presenting symptoms were tooth mobility and pain, swelling and lower lip sensory changes. The latter representing a well-documented neurological manifestation of metastatic malignancy [3] and hence warranting thorough investigation for patients with a history of cancer. Initial radiography yielded radiolucent lesions of the mandible in all cases, some of which were related to the apices of teeth making them indistinguishable from periapical odontogenic infection. Again, the approach to management of these cases was highly diverse. Of the 13 cases which described their treatment, 5 underwent multi-modality treatment with combinations of surgery, radiotherapy, chemotherapy and

Fig. 1 **a** Panoramic radiograph of the patient at first examination showing a periapical radiolucent lesion in *left* mandibular region. **b** Magnetic resonance imaging exhibited marrow infiltrative changes within the *left* body and angle of the mandible extending towards the

inferior ramus involving the inferior alveolar nerve. Also noted was the cortical disruption at the lingual aspect with associated periosteal changes consistent with metastatic disease

immunotherapy. Single-modality treatment was mostly with radiotherapy but also with surgery and chemotherapy.

In this case, symptoms preceded imaging findings. At presentation to her general dentist, she had pain and lower lip numbness, however, plain radiographs and CT imaging showed non-specific loss of medullary bone suggestive of odontogenic infection. It was only when metastatic deposits were identified in the lungs and whole body bone scanning showed widespread metastases did the true nature of the pathology become evident. At that stage, 16 weeks following initial presentation, did an MRI show a classic metastatic focus in the jaw. Several recent studies have highlighted the superiority of magnetic resonance imaging for detecting skeletal metastases especially marrow

changes as opposed to PET-CT imaging which suffered poorer sensitivity due inferior spatial resolution and dependence on histological characteristics of the tumour [4]. Early use of these imaging techniques may prevent the delay in diagnosis in cases where there is a high degree of suspicion in the setting of normal plain imaging.

Most patients presenting with jaw metastases are unlikely to be selected for curative surgical treatment due to the extensive disease commonly observed [5]. Nonetheless, resection may be indicated in patients with small, isolated metastatic lesions, and this may prolong survival [6]. The considerable variation in the management used in the cases reviewed reflects the multiplicity in disease staging, disease progression, patient and clinician factors. Ultimately, all

Fig. 2 Histopathology: dysplastic epithelioid cells. Immunohistochemical stains of the tumour cells were positive for HMB45 and Melan-A with focal staining for S100, confirming the diagnosis of malignant melanoma metastatic to the mandible

patients died with survival ranging from 3 months to four and a half years.

Conclusion

Metastatic melanoma to the mandible represents a rare clinical entity which may arise many years following treatment of the cutaneous primary. This case demonstrates the difficulties in early diagnosis as symptoms preceded radiographic findings using high resolution modalities. Earlier use of magnetic resonance imaging with or without the use of bone scintigraphy may provide the sensitivity needed for early identification of lesions where the clinical

suspicion is high. The propensity for disseminated disease in metastatic melanoma requires thorough staging and a multidisciplinary approach to establish treatment goals which will improve survival and optimise quality of life. Identification of patients with favourable prognostic factors in whom a more aggressive treatment approach could be justified may result in improved survival in some cases.

Compliance with Ethical Standards

Conflict of interest None of the authors have any conflicts of interest to declare.

Ethics Approval This article does not contain any studies with human participants performed by any of the authors.

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