

Direct bony invasion of malignant melanoma

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ABSTRACT

Malignant melanoma is known to spread by local extension, by the lymphatics by the blood stream. Direct invasion of the bone from a cutaneous melanoma is unknown. Hence, this case is presented in view of its rarity. A 75-year-old Caucasian lady presented with a small papillary lesion in the region of a recurrent chronic cellulitis on the lower third of the lateral aspect of the right leg. Histopathology diagnosed the lesion as locally advanced malignant melanoma. Radiological investigations by X-ray and magnetic resonance imaging revealed malignant infiltration of the tibia in its mid and lower third with two soft tissue metastatic masses adjacent. Histology following amputation confirmed malignant melanoma with cranial resection margin involvement. She underwent a further above-knee amputation followed by chemotherapy. The patient recovered from the amputation but subsequently died 6 months later due to bronchopneumonia from lung metastasis.

Key words: Bone tumor, metastatic melanoma, malignant melanoma, direct invasion

INTRODUCTION

Cutaneous melanoma is a malignant neoplasm arising from epidermal melanocytes. The earliest description is in the writings of Hippocrates in fifth century BC.¹ Metastasis from malignant melanoma is known to spread by local extension, by the lymphatics, or by the bloodstream. Blood-borne distant metastases of melanoma are seen in the lungs, gastrointestinal tract, brain, parotid, heart, and skin, but rarely in the bones. The main cause of mortality in malignant melanoma is from the secondaries that may occur many years after excision of the primary lesion. Local extension is centrifugal via dermal lymphatic permeation into the surrounding skin. Bone secondaries are usually from breast, bronchus, thyroid, kidney, and prostrate cancers.

A 75-year-old Caucasian lady presented with recurrence of chronic cellulitis on the lower third of the lateral aspect of the right leg. The cellulitis had been on going for the past 10 years. The current symptoms started 2 months before presentation when she noticed a small papillary lesion, which was biopsied. The histopathology result stated that the lesion was a locally advanced malignant melanoma. During her admission, the lesion progressively increased in size over 2 weeks.

On examination, she was thin but not cachectic. She had a 2 × 2 cm yellow papillary lesion with a surrounding 4 cm

red indurated area over the lower third of the right leg on the lateral aspect [Figure 1]. There were no satellite skin lesions and no palpable lymph nodes.

A plain radiograph [Figure 2] revealed erosion lesions on the right tibia suggesting bone invasion. Her white cell count was 23.9×10^6 (normal 4.0–11.0) and C-reactive protein was 128 mg/L (normal 0–10). Full blood count, urea, electrolytes, liver function tests, and clotting profile were within the normal range. Chest radiograph [Figure 3], ultrasound scan and computed tomography (CT) chest, abdomen, and



Figure 1: Photograph of right lower leg with papillary lesion and adjacent cellulitis

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pelvis [Figure 4] did not reveal any metastases or lymph node involvement. Magnetic resonance imaging [Figures 5 and 6] of the right leg confirmed malignant infiltration of the tibia in its mid and lower third with two further soft tissue masses cranial to this consistent with soft tissue metastases. The Tc99 MDP scan [Figure 7] revealed no other bony hot spots apart from the right tibia.

She initially underwent a below-knee amputation at the Regional Bone Tumour Unit. Histology confirmed malignant melanoma involving adjacent soft tissue with infiltration into periosteum of the bone and cranial resection margin involvement [Figure 8]. The amputation was therefore extended above the knee. She subsequently

underwent adjuvant chemotherapy. Later, she developed subcutaneous nodules in the epigastrium and lung metastasis over the next 4 months. Unfortunately, she died from pneumonia and advanced metastatic cancer at a hospice 6 months later.

DISCUSSION

Malignant melanoma has been considered a rare tumor with an unpredictable natural history. The rate of increase in the incidence of melanoma is greater than for any other cancer in Caucasians, with the exception of bronchogenic carcinoma. It is likely that between a third and a half of all melanomas develop in a benign naevus of many years' standing, which could be the case in our patient. The most common site for females is the lower leg, as in our patient. This is the first case of malignant melanoma with direct invasion of bone in the literature [Table 1].



Figure 2: Plain radiograph of right tibia and fibula showing cortical erosion of lower third of tibia



Figure 3: Chest X-ray: Normal with no signs of metastatic lesions

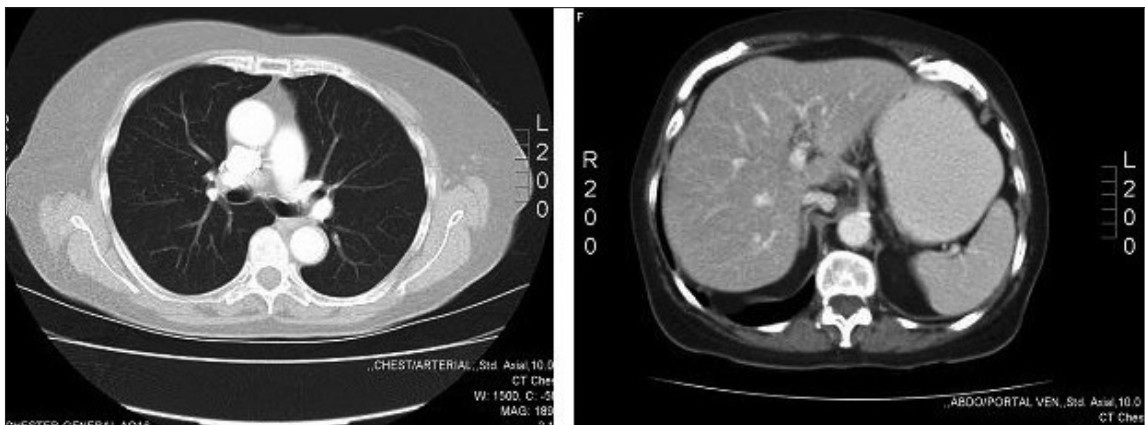


Figure 4: CT scan of chest and abdomen: Normal with no signs of metastatic lesions

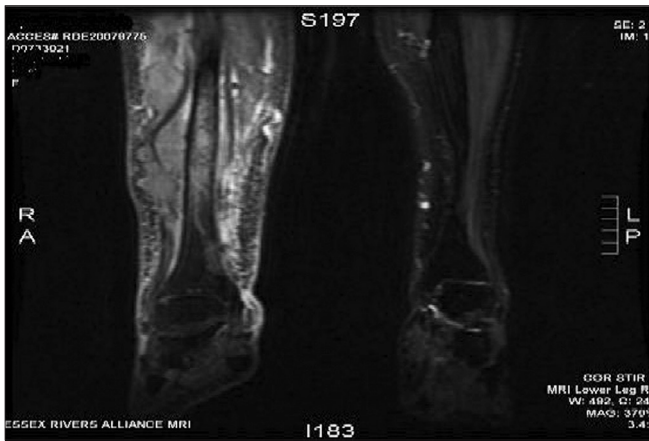


Figure 5: MRI of right leg showing malignant infiltration of tibia in its mid and lower third with adjacent soft tissue masses

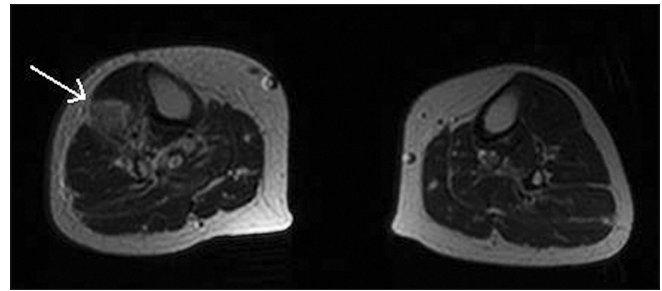


Figure 6: Axial MRI section of right leg showing extent of lesion infiltration down to the tibia

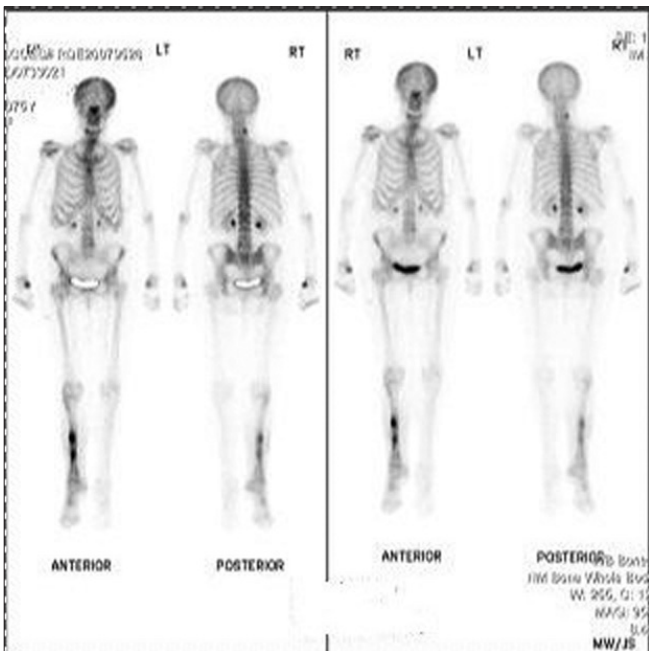


Figure 7: Tc99MDP scan showing hot spots in right tibia

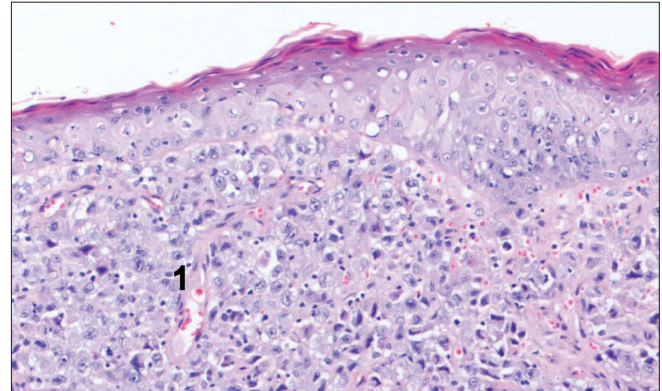


Figure 8a: H and E section showing malignant melanocytes infiltrated into subcutaneous tissues (1)

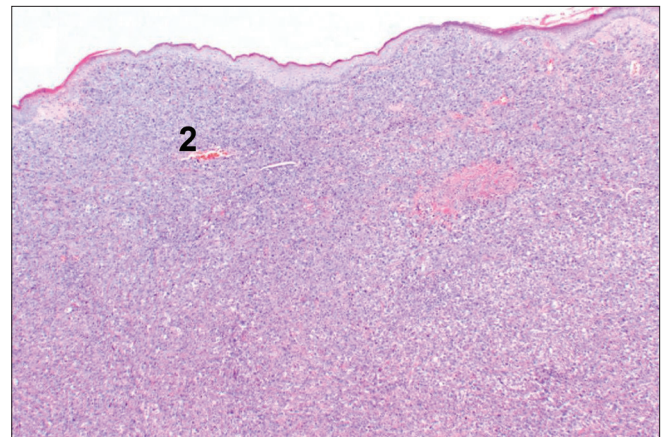


Figure 8b: H and E section showing malignant melanocytes in periosteum of bone (2)

The development of a malignancy in a mole should be suspected if any of the following changes occur:

- | | |
|--------------------|---------------------------|
| Major signs | Minor signs |
| Change in size | Inflammation |
| Change in shape | Crusting or bleeding |
| Change in color | Sensory change, e.g. itch |
| | Diameter 5 mm or more |

Suspicious lesions should be removed completely with a 2 mm margin; use of incision or punch biopsies is deprecated because accurate histological staging is impossible and the treatment is dependent on the histology. In our patient, punch biopsy was performed before diagnosing melanoma. A planned excision was performed when bony involvement was found.

A complete staging workup, including examination of the skin and mucous membranes; CT scans of the chest, abdomen, and pelvis; and a bone scan, should be performed.^{2,3} There is an emerging role for positron-emission tomography in the staging of malignant melanoma.⁴⁻⁶

Radical surgical treatment is favored by many authors, with acceptable mortality and morbidity rates in gastrointestinal metastasis.^{7,8} We opted for radical surgical treatment as we do not have sufficient data on bony malignant

Table 1: Rare tumors of the bone

Primary	Site	Author	Year
Melanoma	Tibia	Mula <i>et al.</i>	Aug 2009
Endometrial carcinoma	Tibia	Ishibashi <i>et al.</i> ¹⁰	Mar 2007
Recurrent basal cell carcinoma	Tibia	Perez de la Fuente <i>et al.</i> ¹¹	Jan-Feb 2006
Colon cancer	Hand	Gamblin <i>et al.</i> ¹²	Jan 2006
Epithelioid hemangioendothelioma	Phanlanx	Kitagawa <i>et al.</i> ¹³	May 2005
Hyalinizing clear cell carcinoma	Hard palate	Chao <i>et al.</i> ¹⁴	May 2004
Fibrous histiocytoma	Distal radius	Jebson <i>et al.</i> ¹⁵	Mar 2004
Clear cell sarcoma	Capitate	Reichert <i>et al.</i> ¹⁶	Nov 2001
Intraosseous lipoma	Calcaneus	Burd <i>et al.</i> ¹⁷	Mar 2001
Thymic tumor	Ring finger	Shannon <i>et al.</i> ¹⁸	Nov 2000
Plasmacytoma	Mastoid	Engelsma <i>et al.</i> ¹⁹	May 2000
Paraganglionoma	Sacrum	Coles <i>et al.</i> ²⁰	Apr 2000
Neurilemmoma	Radius	Gine <i>et al.</i> ²¹	Mar 2000
Pseudo anaplastic giant cell tumor	Sacrum	Layfield <i>et al.</i> ²²	Feb 1999

melanoma. If there is a single site of metastatic disease, surgery is sometimes employed and there is a study examining the use of an adjuvant vaccine ("cancervax") following "metastasectomy".⁹ There is no long-term follow-up or 5-year survival data available on bony metastatic melanoma.

In conclusion, the principles of treatment are proper staging and radical surgery where appropriate.

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