

Synchronous intramuscular metastases of malignant melanoma—case report and literature review

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Received: 29 January 2007 / Accepted: 26 March 2007 / Published online: 24 April 2007
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Abstract Muscular metastasis is a rare event for any malignancy. There are only a limited number of cases reported in the literature in the past. The numbers are even smaller in case of malignant melanoma. We report on an elderly lady with two synchronous skeletal muscle metastases 13 years after initial presentation with malignant melanoma and a brief literature review.

Keywords Melanoma · Metastases · Muscle · Muscular

Introduction

Malignant melanoma commonly arises from the skin and often spreads in a loco-regional fashion via the lymphatics to the local skin, ‘in-transit’ lymphatics subcutaneous tissues and lymph nodes. This is then followed by a wider metastatic spread to distant subcutaneous tissue, and the lungs, liver and brain occur haematogenously [3]. Metastases to the skeletal muscle are rare occurrences. There are few reported cases of muscular metastases in malignant melanoma. We report on an elderly lady with two synchronous skeletal muscle metastases 13 years after the initial presentation.

Case report

A 74-year-old lady had a mole removed from her right cheek 7 years before her first presentation to our unit—histology was reported as ‘benign naevus’ with complete excision. She presented to us with a lump measuring 1 cm over the previous scar. This had been present for some time and apparently fluctuating in size. Initial impression was either an epidermal inclusion or sebaceous cyst. The lesion was excised, but histology stated ‘malignant undifferentiated tumour of subcutaneous fat’ with immunohistochemistry consistent with melanocytic origin. Subsequently, a review of old histology was requested, and afterward, a new report confirmed a melanoma with a Breslow’s thickness of 3.5 mm. A wider excision of the scar was performed, and staging radiology did not reveal any metastases.

She had no recurrence or problems for 3 years until she developed several more painless subcutaneous metastases, all on the trunk distant from the primary on the cheek. A total of ten lesions were excised in five settings, spread over a 2-year period under both local and general anaesthesia. Repeat radiological studies failed to show any other metastatic disease elsewhere.

Two years later, she came back with a painful lump on her left anterior thigh of several months duration, which she attributed to her arthritis. Clinical assessment suggested the mass was located in the deep fascia within the muscle. Computed tomography (CT) of her thigh showed an intramuscular deposit in the quadriceps muscle. No other metastatic lesion was detected. The combined positron emission tomography (PET) and CT scan performed confirmed malignant deposits within the musculature of the left quadriceps, and it also demonstrated an asymptomatic metastasis in the left fifth intercostal muscle with no metastatic disease elsewhere (see Fig. 2). Both intramuscu-

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Fig. 1 Intra-operative picture of metastatic deposit in the quadriceps (just below the tips of the curved scissors)

lar lesions were excised, and histology was positive for malignant melanoma (see Figs. 1 [intra-operative picture] and 2).

Four months later, she re-presented with disseminated subcutaneous disease, and radiological investigation showed metastatic spread to multiple nodal regions, lungs, brain, kidney and adrenals. She received supportive and palliative treatment and died 2 months later.

Discussion

Malignant melanoma can metastasise anywhere. Usually, it spreads loco-regionally into the skin, subcutaneous tissue and lymph nodes before going into distant organs—the subcutaneous fat, lungs, liver, brain, bones and intestines, in that order. Direct or local invasion into the skeletal muscle is well recognised [2, 3, 10], but intra-muscular metastasis is uncommon [1]. Previous literature records only ten documented cases (see Table 1). Ours is the first reported

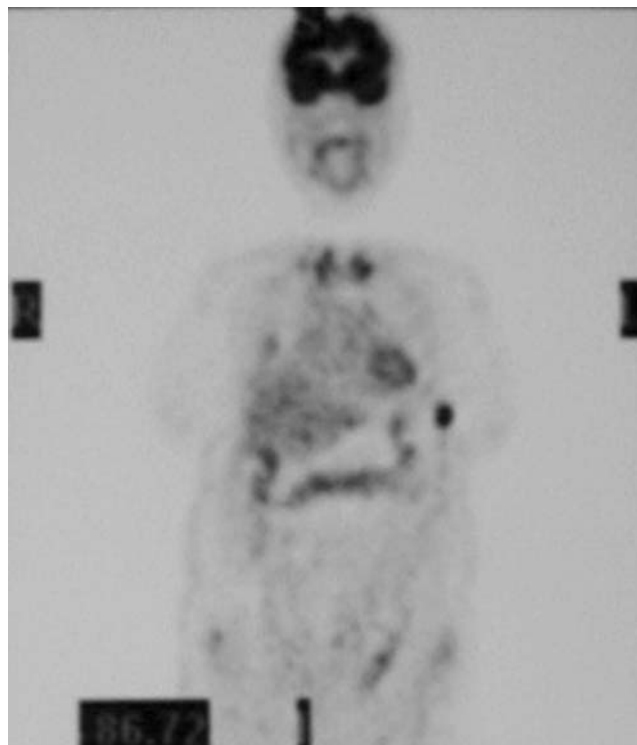


Fig. 2 PET scan image showing a hotspot on the left side of the chest (a combination of PET/CT scans show that the deposit is in the intercostals muscle—not shown)

case with synchronous muscular metastases and intercostal musculature involvement.

Despite the large percentage of total cardiac output providing muscle blood supply and the fact that skeletal muscle represents nearly 50% of total body mass, it is one of the most unusual and rare sites for metastases. Several hypotheses exist to explain this—for example, irregular blood flow, metabolism, muscle pH, high tissue pressures, lactic acid production and some have suggested that protease inhibitors in the muscle extracellular matrix may resist invasion by tumor cells [1].

Table 1 Muscular metastases from malignant melanoma

| Author | No. Cases | No of sites | Muscle involved |
|----------------------------|-----------|-------------|------------------------------|
| Hering et al. [1] | 2 | 1 | Gracilis |
| | | 1 | Vastus lateralis |
| Viswanathan and Khanna [2] | 1 | 1 | Quadriceps |
| Merimsky et al. [4] | 1 | 1 | Erector spinae muscle (back) |
| Parache and Menard [5] | 1 | 1 | Quadriceps |
| Haskova et al. [6] | 2 | 1 | Masseter |
| | | 1 | Masseter |
| Weiss et al. [9] | 1 | 1 | Extra-ocular |
| Mercer and Devaraj [11] | 1 | 1 | Temporalis |
| Yoshioka et al. [12] | 1 | 1 | Quadricep (vastus lateralis) |
| Mat Saad | 1 | 2 | Quadriceps and intercostals |

Herring et al. [1] in their series (54,000 new cancer cases in 16 years) found intra-muscular metastases in 15 patients. His subsequent literature review discovered another 52 cases (the figures represent less than 0.02% of diagnosed cancer cases), and only two patients had primary melanoma.

After several series of autopsies, findings of muscular metastases range from 0.8 to 20% (quoted from [1, 2]). These suggest that intra-muscular metastases are more common than one previously thought and are probably under-reported [1, 2].

Muscular metastases can be easily mistaken as soft tissue sarcoma—they both have similar clinical presentations, anatomic distribution and radiological findings. Some authors suggest pain as a key distinguishing symptom [2, 8, 9] for a metastatic lesion, but others found that patients can present with painless swellings [1, 7].

Various imaging modalities are available to detect intramuscular lesions, but none are specific enough to differentiate a metastatic lesion from sarcoma or other muscular abnormalities [2, 7]. CT, magnetic resonance imaging and PET scans are all used in the evaluation of a lesion or occasionally to detect occult malignancies.

Treatment of melanocytic muscular metastasis needs to be individualised. Surgical resection can be considered for isolated lesions. Some authors suggest minimal intervention to avoid high morbidity associated with large muscle resection [1]. In cases of multiple metastases, palliative approaches are adequate. Patients may be offered chemo-, immuno- or radiotherapy. The latter may effectively palliate pain secondary to muscular metastases.

In summary, muscular metastases are very rare in malignant melanoma and often present late. Radiological imaging may help in diagnosis, although they cannot differentiate it from other muscular lesions or sarcomas.

The use of PET/CT scanning may increase pick-up rate of surgically respectable muscular metastases. Prognosis is poor, and most patients die a few months after diagnosis. Thus, supportive and palliative treatment remains important.

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