

Case Study. A late diagnosis of nail melanoma arising in the hallux

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Subungual or nail melanoma is a rare form of the disease, accounting for only 3.5% of all cases of melanoma. The authors present a case that highlights the common issue of delayed diagnosis contributing to a poor prognosis for the condition

Case Presentation

A 68-year old Caucasian male presented in the clinic with an 18-month history of a 'bruised' toe nail. A generally fit and well retired chemical worker, he had recently attended the local minor injuries centre following a GP referral as he was concerned that it had been weeping and was becoming increasingly tender, especially when wearing shoes. At the time, the lesion was diagnosed as a haematoma and was lanced to drain the area. The treating nurse advised the patient to see a podiatrist. The patient was also prescribed a course of antibiotics but he reported this had made little difference to the toe.

On examination at the podiatry clinic (see Figure 1) there was a raised pigmented lesion on the nail bed with severe erosion of the nail plate. The patient could not recollect any particular trauma to the area and reported that the lesion had been steadily growing over an 18-month period.

In view of the unusual and suspicious appearance, along with the history, the patient was immediately referred to the local dermatology department. Within a fortnight, following an assessment of the patient, a biopsy was taken from the area and a diagnosis of malignant melanoma was made with a reported Breslow thickness of 8mm.

Subsequently, the hallux was amputated and as tests had revealed swelling of an inguinal lymph node, which suggested metastatic spread of the lesion, surgical removal of the inguinal lymph nodes was undertaken. A subsequent CT scan was performed of the head and torso, which were clear. The patient's treatment plan was a 3-monthly check and 6-monthly CT



Figure 1. Raised pigmented lesion on the nail bed with severe erosion of the nail plate.

scans. No further treatment was deemed necessary at this stage.

Discussion

Melanoma of the nail is a rare tumour most frequently affecting the hallux and thumb.¹ Evidence suggests it only represents around 0.7-3.5% of all melanoma,^{2,3} although this rate is much higher in non-Caucasian populations such as African⁴ and Oriental,^{5,6} reflecting the lower proportion of melanoma elsewhere in more pigmented skin types.

Nail melanoma most frequently affects the hallux and thumb nail unit, presumably as Banfield⁷ suggests because these two areas hold the largest proportion of nail matrix tissue. Considering the relatively small surface area of the nail matrices (well below 1% of total body surface area), nail melanoma probably occurs more frequently than would be expected.⁸ The reasons for this are unclear. The aetiology of nail and other acral melanoma is unlike cutaneous melanoma elsewhere. One study

investigated the risk factors: although total body sun exposure was shown to be a risk factor, there was no clear cause.⁹ Other factors suggested included occupational exposure to chemicals (such as farmers, chemical industry workers, photographers)^{9,10} and having a higher count of plantar and palmar naevi.¹¹

The higher than expected prevalence of nail unit lesions could conceivably be put down to trauma, but this is debatable based on current evidence. In a case control study of 156 patients with cutaneous melanoma, patients showed an elevated, but statistically insignificant, risk of developing melanoma after trauma to pre-existing lesions.¹² Morhle & Hafner,¹³ in a study of 406 cases of specifically nail melanoma, identified a high proportion of hallux and thumb lesions and demonstrated many patients who reported trauma related to the onset of their lesions. However, they suggested that this could be coincidence.

Work by Briggs¹⁴ suggested that coincidental trauma may simply draw the patient's attention to a pre-existing melanoma. Kaskel *et al*¹⁵ in a survey of over 300 patients showed that over 90% did not believe that trauma played a part in the development of their lesions and highlighted that acral areas of the body such as the hands, feet and nails were naturally more prone to physical trauma anyway. Fanti *et al*¹⁶ concluded trauma not to be a risk factor in their cohort of 1170 melanoma patients (including 34 with nail melanoma).

The presentation of melanoma of the nail unit has been well described by Bristow *et al*¹⁷ in their foot melanoma guidelines. There are two main patterns of nail unit melanoma - longitudinal

melanonychia and amelanotic tumours. The development of a solitary longitudinal melanonychia streak, arising from the nail matrix in a white, older adult should be considered suspicious, particularly where there is progressive widening of the streak and blurring of its borders. Amelanotic melanoma of the nail unit presents more of a diagnostic challenge, as lack of pigment in a developing lesion can lower levels of suspicion for the patient and practitioner alike. Essentially, any change to a single nail, or its peri-ungual structures that fails to resolve or respond to treatment should be considered for prompt referral.

Successful management of the problem can only be achieved if the patient consults early. Late presentation of melanoma, particularly in the nail and acral locations, is a common^{17,18} but serious problem leading to delay and a poorer prognosis, as the patient presents with more advanced disease. Commonly cited reasons for delay in presenting melanoma to a healthcare professional include gradual of 'quiet' appearance of the lesion, lack of systemic signs, absence of awareness of the urgency, occupational reasons and absence of

Thickness at excision	Probability of 5 year survival
<1mm	>95%
1-2mm	90%
2-4mm	63-67%
>4mm	45%

Table 1. Five-year survival rates predicted by the Breslow thickness

pain.¹⁹ In addition, as this case illustrates, misdiagnosis by healthcare professionals is another delaying factor. Securing a diagnosis relies on a vigilant healthcare professional with a level of awareness of these lesions. A study of physicians in the diagnosis of melanoma demonstrated that acral and nail lesions were frequently misdiagnosed.²⁰

Management

A diagnosis is made after biopsy, histology and specialist interpretation. The only effective treatment for the condition is complete excision of the lesion before metastases occur, although, for the reasons given above, lesions may present late. The

Breslow thickness is a standard measurement used in histology and gives an indication of the prognosis in patients with confirmed melanoma.²¹ The Breslow thickness is a measure (in millimetres) of the vertical depth of the tumour measured from the top layer downward to the lowest tumour cells. Lesions that have a greater thickness are closer to the lymphatic vessels and capillaries and are therefore more likely to metastasise. The five-year survival rates predicted by the Breslow thickness are as shown in Table 1.²²

The prognosis maybe adversely affected if regional and distant metastases develop. Typically with melanoma these tend to occur in the surrounding skin, bone and the brain. In most cases of nail melanoma, an amputation of part or the whole of the affected digit is the surgical choice with regular monitoring of the patient, as acral lesions tend to have more poorly defined margins making clear excision more difficult.²³

The role of the podiatrist in detecting lesions early is the key. In addition, educating the public and other healthcare professionals to raise awareness of

melanoma should be a priority, emphasizing that it can occur anywhere on the skin – including on the foot or in the nail.

Suggested Reading

1. Bristow IR, de Berker DA, Acland KM, Turner RJ, Bowling J: Clinical guidelines for the recognition of melanoma of the foot and nail unit. *J Foot Ankle Res* 2010; 3.

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