CASE REPORT

# Malignant Melanoma of the Foot in Patients with Diabetes Mellitus – A Trap for the Unwary

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**SUMMARY**

**Melanomas on the foot are difficult to differentiate from diabetic foot ulcers (DFU). In particular, acral lentiginous and amelanotic melanomas have a high chance of being misdiagnosed. We present two patients with diabetes mellitus and malignant melanomas of the foot initially diagnosed as DFU. Both cases were treated with wide excision amputation and local dissection, without adjuvant chemotherapy or radiotherapy. Both patients remain disease-free up to the last follow-up visit. It is important to maintain a high index of suspicion and a skin biopsy should be done in any DFU with atypical features.**

## INTRODUCTION

Diabetic foot ulcers (DFU) are common sequelae of long-standing diabetes mellitus (DM), and associated with pigmented dermopathy, anaesthesia, bleeding, and poor wound healing [1].

Most melanomas are easily detected and excised early, except for melanomas on the foot [2]. In patients with diabetic sensory neuropathy, pressure and repeated trauma to areas on the sole of the foot can cause melanomas to resemble a DFU [3]. Acral lentiginous melanomas and amelanotic melanomas on the plantar and subungual areas carry a high likelihood of misdiagnosis [3-5]. We present two cases involving patients with long-standing DM to illustrate these points.

## CASE REPORT

### Case 1

An 80 year old Indian male was referred for management of a non-healing ulcer of the left big toe. He had type 2 DM for 40 years on oral medication.

Three months prior to presentation, he sustained a small laceration to the tip of his left big toe after a heavy object fell on it, which was dressed at a nearby clinic. After a few weeks, the site of injury began to ulcerate and a fungating mass grew rapidly at the ulcer edge. He consulted the clinic doctor who diagnosed a pyogenic granuloma which was removed by local excision. Subsequently, the ulcer did not heal and the mass re-grew at the same site. The patient also noticed multiple hard nodules on his left leg. The clinic doctor attempted a second excision and eventually referred him to our centre.

On examination, there was a fungating mass measuring 2 x 2 cm over the tip of the left big toe involving the distal third of the nail bed. The mass and surrounding skin were not pigmented, and the wound was clean with exuberant granulation tissue. The left inguinal lymph nodes were enlarged, hard, and fixed, with five other hard subcutaneous nodules over the medial aspect of his left leg and thigh. There was no clinically detectable sensory neuropathy, peripheral pulses were well-felt, and the ankle-brachial index was normal.

A computed tomography (CT) scan of the abdomen and inguinal regions revealed no para-aortic lymphadenopathy, and a biopsy of the mass showed a malignant melanoma, amelanotic type. This was treated by a wide excision amputation of the big toe, cutaneous nodules, and lymph node dissection. No adjuvant chemotherapy or radiotherapy was given and the patient remains disease-free after one year follow-up.

### Case 2

A 52 year old Malay woman presented with a non-healing ulcer of four months duration. She had type 2 DM for 15 years on oral medication.

She sustained a small puncture wound on the sole of her left foot from stepping on a sharp object. This ulcerated and was seen by her family doctor who diagnosed a DFU. The ulcer was dressed daily, but as this failed to improve over a few months, the patient was then referred to our centre.

On examination, there was an ulcer on the sole of her left foot near the base of the 4th and 5th metatarsals measuring 3 x 3 cm with a hyper-granulating base (Fig. 1). The skin surrounding the ulcer was pigmented, and there were no signs of local infection. No palpable lymph nodes or other masses were found. There was minimal sensory neuropathy over the distal portions of both feet, but the peripheral pulses were well-felt and the ankle-brachial index was normal.

The abdominal CT was normal, and a wedge biopsy of the lesion showed a malignant melanoma, acral lentiginous type. The tumour was composed of lobules and sheets of epithelioid cells with lymphocytic infiltration and occasional signet ring cells. Ulceration and pigmentation were seen, the mitotic rate was 5/mm$^2$, and invasion was to the recticular dermis (Clark's level IV, 5.5 mm). All resection margins were tumour-free, with no perineural or lymphovascular invasion.

*This article was accepted: 10 March 2012*

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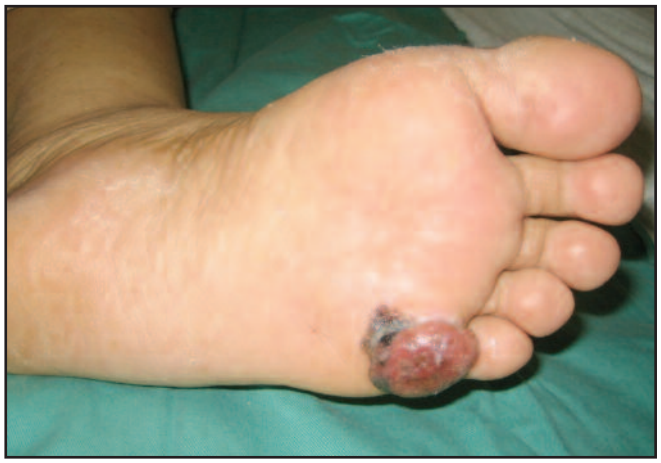

**Fig. 1:** Malignant melanoma, acral lentiginous type, on the plantar aspect of the left foot from the patient in case report 2. Photo was taken just prior to excision of the lesion.

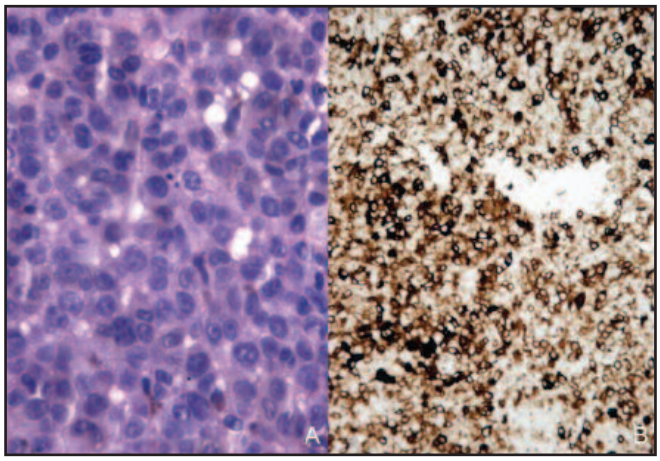

**Fig. 2:** Wedge biopsy from the patient in case report 2 showing a malignant melanoma, acral lentiginous type. (A) Sheets of neoplastic cells with large nuclei and prominent nucleoli. In some cells, pigmentation is seen. H&E stain x400. (B) Tumour cells stain positive for HMB-45, a melanoma restricted antigen. Immunostain MSIP protocol x100.

This was treated by wide local excision and amputation of the 4th and 5th toes. She was referred to the medical oncologist, but declined follow-up after about six months, with no evidence of recurrence at her last visit.

## DISCUSSION

The typical presentation of a non-healing DFU is in the context of long-standing DM, significant sensory neuropathy, vascular compromise, poorly developed granulation tissue, and evidence of excessive pressure such as calluses. In the absence of bacterial infection or repeated trauma, most of these ulcers are atrophic and often display a 'punched out' appearance.

For these two cases, there were some unusual characteristics which should have raised clinical suspicion. Although the diabetes was long-standing, there was relatively little sensory neuropathy or vascular compromise. The ulcers were clean in both cases, and yet the granulation tissue was profuse. The location of the ulcer in the first case was not in a typical pressure spot, and the area of the ulcer in the second case was free of callosities (Fig. 1), once again suggesting that these were not pressure ulcers.

In the first case, the diagnosis of pyogenic granuloma is highly unusual as it normally occurs in younger women and children, is located in the head and neck region, and is very rare in the lower limbs. After excision, these lesions should be sent for histology otherwise malignancy can be missed.

In the second case, discolouration of the granulation tissue in the absence of infection, and areas of irregular dense pigmentation surrounding the ulcer should immediately raise suspicion of a melanoma. While diabetic dermopathy can be pigmented, it is usually centred on the shins and symmetrical on both legs. For this patient, the other parts of the foot were free from excess pigmentation, making diabetic dermopathy an unlikely cause.

From these two cases, we see that melanomas on the foot can initially resemble a DFU. The authors acknowledge that the lesions when seen initially at primary care may have appeared relatively benign compared to when seen at our centre. This is why a high index of suspicion is necessary, so that whenever a DFU behaves atypically and where there is no other plausible cause for the atypical behaviour, quick referral for a skin biopsy can be done.

## REFERENCES

1. Yusof MI, Sulaiman AR, Muslim DA. Diabetic foot complications: a two-year review of limb amputation in a Kelantanese population. Singapore Med J 2007 Aug; 48(8): 729-32.
2. Franke W, Neumann NJ, Ruzicka T, Schulte KW. Plantar malignant melanoma -- a challenge for early recognition. Melanoma Res2000 Dec; 10(6): 571-6.
3. Rogers LC, Armstrong DG, Boulton AJ, Freemont AJ, Malik RA. Malignant melanoma misdiagnosed as a diabetic foot ulcer. Diabetes Care2007 Feb; 30(2): 444-5.
4. Soon SL, Solomon AR, Jr., Papadopoulos D, Murray DR, McAlpine B, Washington CV. Acral lentiginous melanoma mimicking benign disease: the Emory experience. J Am Acad Dermatol 2003 Feb; 48(2): 183-8.
5. Yesil S, Demir T, Akinci B, Pabuccuoglu U, Ilknur T, Saklamaz A. Amelanotic melanoma misdiagnosed as a diabetic foot ulcer. J Diabetes Complications2007 Sep-Oct; 21(5): 335-7.