

# A Case Report: Malignant Melanoma Misdiagnosed As a Diabetic Foot Ulcer

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## Abstract

**Rationale:** Acral lentiginous melanoma (ALM) often lacks the typical signs of malignant melanoma. Due to its uncommon locations and atypical clinical features, ALM is frequently misdiagnosed, resulting in poor prognosis.

**Patient Concerns:** A 78-year-old female presented to our center with two ulcers on her right foot. The initial diagnosis was diabetic foot ulcer. However, the ulcers did not improve after two weeks of treatment.

**Diagnoses:** An incisional biopsy of the lesion revealed malignant melanoma. **Interventions:** The patient underwent wide excision, skin grafting, and biotherapy. **Abbreviation:** ALM = acral lentiginous melanoma.

**Keywords:** Foot ulcer, malignant melanoma, misdiagnosis

## Introduction

Malignant melanoma is a serious form of skin cancer that arises from the pigment-producing cells known as melanocytes. It is responsible for around 79% of all skin cancer fatalities, even though it accounts for only 4% of skin cancer cases.<sup>[1]</sup> The incidence of this disease is rising more rapidly than that of any other type of cancer globally.<sup>[2]</sup> Acral lentiginous melanoma (ALM), a subtype of malignant melanoma, comprises an estimated 7% of all malignant melanoma cases.<sup>[3]</sup> This type of melanoma does not exhibit the classic "ABCD" signs (asymmetry, border irregularity, color variation, diameter) typically associated with malignant melanoma. Due to its unusual locations and atypical clinical features, ALM is often misdiagnosed, leading to prolonged courses of inadequate therapy.<sup>[4]</sup> Retrospective studies have shown that the misdiagnosis rate for ALM ranges from 25% to 36%. ALM frequently presents as an ulcer and is commonly mistaken for other conditions such as vasculitis, venous ulcers, or diabetic foot ulcers. From January 2003 to December 2014, our hospital admitted 1132 inpatients with diabetic foot ulcers and 177 inpatients with ALM. During this period, one case of ALM was misdiagnosed as a diabetic foot ulcer.<sup>[5]</sup>

## Types of Malignant Melanoma:

- **Superficial Spreading Melanoma:** The most common type, often found on the trunk in men and on the legs in women. It typically spreads across the top layer of the skin before penetrating deeper.
- **Nodular Melanoma:** This type is more aggressive and is often recognized by a bump that can be black, blue, red, or skin-colored
- **Lentigo Maligna Melanoma:** Usually occurs in older adults on sun-damaged skin, particularly on the face, ears, and arms. It starts as a flat or slightly elevated mottled tan, brown, or dark brown discoloration.
- **Acral Lentiginous Melanoma (ALM):** A rare form that typically appears on the palms, soles of the feet, or under the nails. ALM does not present with the classic melanoma signs, leading to frequent misdiagnoses.

## Clinical Features:

- **ABCD Rule:** Common signs include Asymmetry, Border irregularity, Color variation, and Diameter larger than 6 mm.
- **Symptoms:** Changes in an existing mole, the development of a new pigmented or unusual-looking growth on the skin, and sometimes itching, tenderness, or pain.

**Diagnosis:**

- **Physical Examination:** Initial evaluation using the ABCD rule and dermatoscopy.
- **Biopsy:** A definitive diagnosis is made through a biopsy, where a sample of the suspicious lesion is examined microscopically.
- **Staging:** If melanoma is confirmed, further tests (e.g., sentinel lymph node biopsy, imaging) may be done to determine the stage and extent of spread.

**Treatment:**

- **Surgical Excision:** The primary treatment for localized melanoma, involving the removal of the tumor with a margin of healthy tissue.
- **Immunotherapy:** Used for advanced melanoma to boost the body's immune system to fight cancer.
- **Targeted Therapy:** For melanomas with specific genetic mutations (e.g., BRAF mutations), drugs that target these mutations can be used.
- **Radiation Therapy and Chemotherapy:** Less commonly used but may be considered in certain cases, especially for advanced stages.

**Prognosis:**

- **Early Detection:** The prognosis is excellent for melanoma detected early and treated promptly.
- **Advanced Stages:** Prognosis worsens significantly once melanoma has spread to lymph nodes or other organs. Five-year survival rates drop considerably with metastatic disease.

**Prevention:**

- **Sun Protection:** Using sunscreen, wearing protective clothing, and avoiding peak sun hours.
  - **Avoiding Tanning Beds:** Reducing exposure to artificial UV radiation.
- **Regular Skin Checks:** Monitoring skin for new or changing moles and seeking medical advice for suspicious changes.
- **Education and Awareness:** Understanding risk factors and early signs of melanoma for timely detection and intervention.

Malignant melanoma is a potentially deadly skin cancer, but with early detection and appropriate treatment, the outcomes can be significantly improved. Regular skin examinations and protective measures against UV exposure are crucial in preventing and identifying melanoma at an early stage.

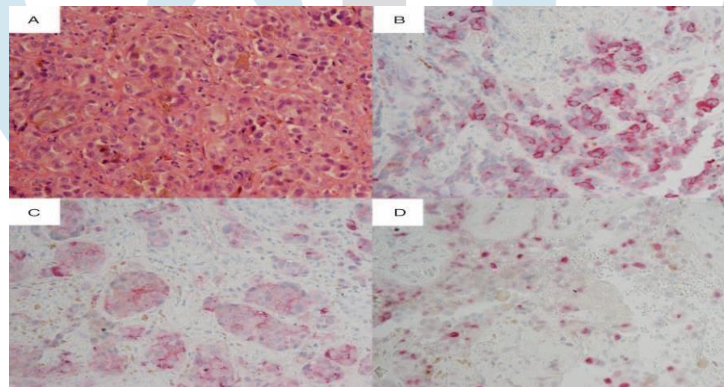
**Case Report:**

A 73-year-old female patient presented to our center with ulcers on her right foot that had been present for six months. She had an eight-year history of poorly controlled type 2 diabetes mellitus, complicated by peripheral neuropathy and peripheral arterial disease. Examination revealed two ulcers, each 0.5 cm in diameter, on her right heel, with seemingly pigmented margins. One ulcer had red granulation tissue, surrounded by callus, with no active drainage, erythema, edema, or other signs of infection (Fig. 1). The patient reported minor pain at the wound site. Diabetic foot ulcer was initially considered as the primary diagnosis. She was treated with insulin, periodic antibiotics, wound debridement, daily dressing changes, and medications for neuropathy and peripheral arterial disease over two weeks. However, the ulcers did not improve. An incisional biopsy was performed to rule out other conditions. Histopathology showed tumoral cells positive for HMB45 and S100, and partly positive for Ki-67 (Fig. 2), indicating malignant melanoma with a Breslow thickness of 1.6 mm.



**Fig 1: The ulcers on the right heel.**

No evidence of metastasis was found. The patient underwent wide excision with a 2 cm margin, followed by skin grafting and biotherapy. The lesion healed completely, and no further metastases have been detected to date.



**Figure 2: illustrates the pathological examination findings:**

- (A) Hematoxylin and eosin (H&E) stain at 300x magnification.**
- (B) Positive staining of tumor cells for HMB-45 at 300x magnification.**
- (C) Positive staining of tumor cells for S100 at 300x magnification.**
- (D) Partially positive staining of tumor cells for Ki-67 at 300x magnification.**

### Discussion

Several studies have highlighted the poor prognosis associated with misdiagnosed cases of acral lentiginous melanoma (ALM), primarily attributed to delayed diagnosis and prolonged periods of inadequate therapy.<sup>[6-8]</sup> In some patients, delays in diagnosis and treatment can be attributed to inappropriate and inadequate biopsy procedures.<sup>[9]</sup> There is currently no consensus on the optimal timing for biopsy of a nonhealing, stubborn foot ulcer due to the rarity of reported misdiagnosed cases. Foot lesions often go unnoticed by both patients and clinicians. Even when discovered, melanoma may not be initially considered as a likely diagnosis due to its low incidence, particularly in cases of acral lentiginous melanoma (ALM).

However, clinical experience suggests that clinicians should consider early biopsy in the absence of typical risk factors for diabetic foot ulcers, such as history of trauma, poorly controlled blood glucose, peripheral arterial disease, or diabetic neuropathy. Biopsy should also be considered if the ulcer does not respond to therapy and no clear cause for its intractability has been identified. Moreover, early biopsy is crucial when the ulcer displays atypical features like granulation tissue and pigmentation.

In summary, clinicians must maintain a high level of suspicion to distinguish malignant melanoma from other benign foot skin lesions to minimize misdiagnosis rates. Early identification of ALM through biopsy followed by aggressive treatment can potentially improve the 5-year overall survival rate.<sup>[10]</sup>

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