

Polypoid Acral Amelanotic Melanoma: A Rare Variant Treated with Wide and Deep Surgical Excision

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ABSTRACT Polypoid melanomas are unusual, as are amelanotic ones. Similarly, polypoid melanomas are not usually acral or amelanotic. They can be challenging to diagnose clinically, as they may resemble acral lentiginous nevus, polypoid Spitz nevus, eccrine poroma, schwannoma, pyogenic granuloma, verrucous carcinoma, fibrosarcoma, basal cell carcinoma, and pyoderma gangrenosum. We delineate a 64-year-old woman with an acral amelanotic polypoid melanoma on her sole. It was successfully removed surgically without limb amputation.

KEY WORDS: polypoid melanoma; acral melanoma; amelanotic melanoma; skin cancer; excision

INTRODUCTION

Several atypical variants of malignant melanoma may be challenging to diagnose. We describe a rare melanoma variant, an acral polypoid amelanotic melanoma, located on the sole. It was successfully treated with wide and deep excisional surgery and with a full-thickness graft.

CASE REPORT

A 64-year-old white woman complained of an enlarging nodule on her left sole at the pedal vault. She attributed the onset to stepping on a nail four months earlier. The nodule was not pruritic, tender or bleeding. She felt well except for generalized weakness, fatigue, and scaling of the heels. She denied a history of previous skin cancer or melanoma in herself or her family.

On examination an exophytic pink pedunculated tumor was evident with more than half of its vertical diameter protruding above the cutaneous surface, measuring approximately 1.5 x 3.0 x 1.7 cm in height, length and width. (Fig. 1 a and b). Overlying skin appeared macerating. At one pole the tumor had a small intact vesicle.

The clinical impression was of a pyogenic granuloma, with the differential diagnosis including a partially thrombosed hemangioma. As a malignant tumor was not suspected, the lesion was excised at its base, partially closed with subcutaneous sutures, and left for secondary healing. Forty-eight hours later the wound was fully closed, covered with a crust. The histopathology showed a pigmented, ulcerated melanoma, Clark level IV, Breslow – 6 mm, S100 (+),

HMB45(+), Melan A (+), Ki67 ~ 40% (Fig. 2). The tumor was composed of atypical epithelial and spindle cell-like complexes of melanocytes located in the dermis, basal membrane zone and epidermis, and a high mitotic rate (up to 10 mm). Besides, the tumor had an ulceration and was not completely excised. BRAF mutations were negative. Circulating S100 was normal – 94.42 pg/nl (normal = 0.0 – 105.0 pg/nl). Blood analysis showed diminished red blood cell count with a low hematocrit and hemoglobin, and increased LDH of 552 U/L (normal = 125-220 U/L).

Two weeks after the excision there was an approximately 5 mm large erosive papule on the sole at the same place (Fig. 1 c and d). Magnetic resonance imaging (MRI) showed an approximately 1 cm tumor in the pedal skin without deeper involvement of muscles or bones (Fig. 3). The second operation, one month after the first, resulted in an approximately 5 cm wide and 3 cm deep excision below the plantar aponeurosis in the pedal muscle. The defect was closed with a full-

thickness graft, taken from the inguinal area (Fig. 4). The post-operative period and healing of the graft were excellent, the histopathology again showing a malignant melanoma. Inguinal lymph node ultrasonography and other systemic investigations were negative. The patient's melanoma was staged as T4b-NoMo (Stage II). In a period of 8 to 12 months, local skin metastases developed, which were excised and histologically proved to be malignant melanoma. In addition, positive inguinal lymph nodes were found. Nevertheless, patient remained negative for distant organ metastases. Her melanoma was staged T4b-N2M0 (Stage IIIC). She was placed on therapy with pembrolizumab for metastatic melanoma and is being followed closely.

DISCUSSION

The polypoid melanoma is a rare subtype of nodular melanoma with more than half of its vertical diameter protruding above the cutaneous surface



Figure 1) Polypoid amelanoma melanoma – a red tumor of the pedal arch with more than half of its vertical diameter protruding above the cutaneous surface; b) side view; c) an erosive papule two weeks after the removal of the primary nodule; d) closer view of the papule.

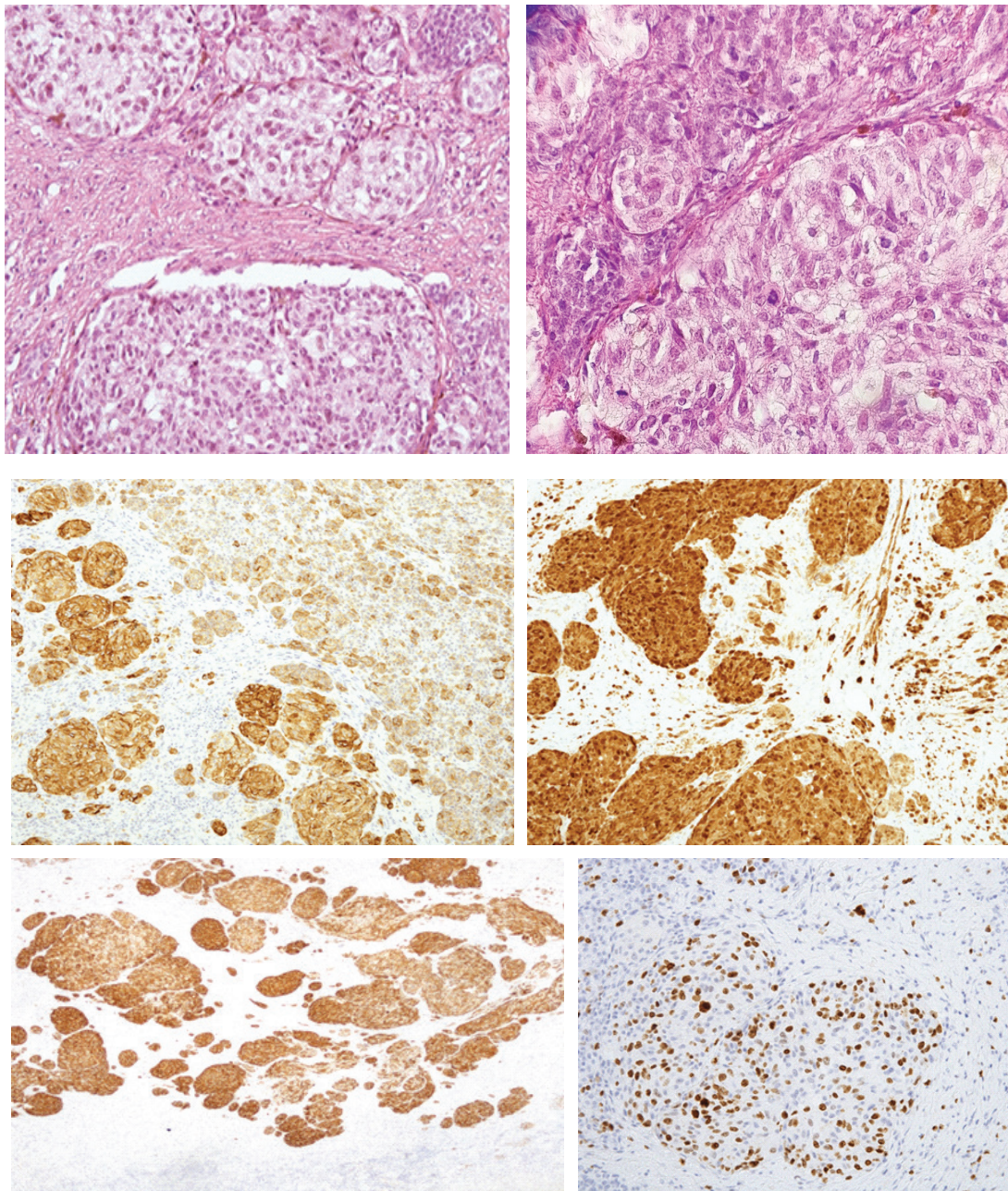


Figure 2) Normal and immuno-histology of the biopsy material (a) Hematoxylin-eosin stain image featuring large nests of atypical epithelial and spindle-cell like complexes; (b) Larger magnification showing atypical mitoses; (c) Melan A positive cells (d) S-100 positive melanocytes; (e) HMB45 positive cells; (f) Ki67 positive melanocytes.

(1-3). It may be entirely above the normal cutaneous surface, connected to the underlying skin by a stalk or partly above and partly below it if there is invasion of the stalk (3). Differential diagnosis of PM includes polypoid Spitz nevus, acral melanoma, pyogenic granuloma, eccrine poroma, neurofibroma, and fibrosarcoma (4-6).

Acral melanoma can be evident in the typical forms, specifically characterized as lentiginous, nodular or superficial spreading. Rarely, acral melanoma

may be amelanotic or desmoplastic. The differential diagnosis of acral melanoma usually includes acral lentiginous nevus, poroma, schwannoma, pyogenic granuloma, verrucous carcinoma, pyoderma gangrenosum, diabetic foot ulcer, and Charcot-Marie-Tooth disease (5).

Polypoid acral melanoma, in comparison with other polypoid melanomas, is rare, especially on the sole, where the only likely place of exophytic growth is pedal vault. Although the reported incidence of





Figure 3) MRI of the left feet showing approximately 1 cm large lesion in the pedal skin

the polypoid melanoma is highly variable and ranges from 2% to 43% in different series, possibly because of different macroscopic and histopathologic criteria employed for its recognition, a total of only 115 cases have been reported in the medical literature since 1958 and till 2012 (7).

Higher mitosis rates in relatively thin ($\leq 2\text{mm}$) nodular melanomas support the hypothesis that nodular melanoma is a different histopathological entity from its outset (8). It is generally believed that the polypoid melanoma is a rapidly growing neoplasm that is associated with a highly aggressive clinical behavior with a 5-year survival rate of 15-25 %, considerably less than for a typical nodular melanoma, 57% (9,10).

Pyogenic granuloma (PG) mimicking AMM is a very rare clinical variant (10). The same is true for pyogenic granuloma-like AMM, which represented

only 0.5% ($n=10$) out of 2038 melanoma cases in a large study (11). Thus, it is clear that a polypoid and amelanotic malignant melanoma, located acrally and mimicking pyogenic granuloma, is exceptionally rare. Pressure from standing and walking normally suppresses exophytic growth on the feet. The pedal vault is probably one of the few places where this pattern of proliferation can occur in a normal active individual. In general, the rare polypoid melanoma, when seen, is evident on the trunk, head and neck area (7).

The optimal surgical option in melanoma can be challenging (12). In this patient there were two opposing views: amputation of the feet or even leg below the knee or less extreme tissue-saving approach. To facilitate an appropriate operative decision, MRI evaluation may provide a good perspective (13-16). In our case MRI showed that the tumor was not involving deeper structures such as muscle or bone. Accordingly, it was decided not to amputate the feet but rather perform a wide and deep excision below the aponeurosis, creating a large "crateriform" tissue defect, which was covered with a full thickness graft taken from the inguinal area. Wide excision to achieve a histologically negative margin is the standard recommendation in malignant melanoma (17-19). For invasive melanomas ($pT4$) $> 4\text{mm}$ thick, a 2cm safety margin is recommended (18). As for excision depth no firm recommendation exists to our knowledge, but it is advised to excise down to muscle fascia or at least deep adipose tissue (20). In our opinion with nodular melanoma, the excision depth can be as important as width due to the vertical growth phase. The major setback of any surgical option in melanoma – wide or deep – is the vertical sectioning



Figure 4) Surgical operation
(a) wide and deep surgical excision; (b) full-thickness skin graft in place

pathology, which allows examination of less than 1% of the tumor margins (21-23). Prolonged overall survival after mastectomy in stage IV melanoma offers additional hope (24,25). One may also wonder why a melanoma would develop on a non-sun exposed surface (26,27), such as the sole, and how to prevent its development (28).

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