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Rare nodular malignant melanoma of the heel in the Caribbean: A case report

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ABSTRACT

INTRODUCTION: Malignant melanoma of the heel is a rare melanoma subtype with incidence rates that reflect the complex relationship between sun exposure at certain geographic locations, individual melanin levels and overall melanoma risk. It is oftentimes characterized by poor prognosis because of delays in presentation resulting in longitudinal tumor invasion, lymph node involvement and metastasis.
PRESENTATION OF CASE: A 59-year-old woman was admitted to the Eric Williams Medical Sciences Complex, Trinidad and Tobago with a 5 mm pruritic lesion on her left heel. At presentation, the lesion was asymmetric with border irregularities, color heterogeneity, with dynamics in elevation and overall size. She was subsequently diagnosed with malignant melanoma with left inguinal lymphadenopathy. A single stage wide local excision (WLE) of the left heel lesion with a split-thickness skin graft (STSG) and a left inguinal lymphadenectomy were performed. Dacarbazine (Bayer) was administered post operatively.
DISCUSSION: Globally, the incidence of malignant melanoma is rapidly increasing, particularly, in countries like Trinidad and Tobago with a significant population of non-fair skinned individuals. There is need for strategic initiatives to increase patient adherence in these populations.
CONCLUSION: The rarity of malignant heel melanomas heightens the need for increased patient awareness and greater clinical surveillance to ensure early diagnosis and treatment.

1. Introduction

The incidence of malignant nodular melanoma is rare. Most cases (almost 85%) occur in developed countries, where melanoma ranks as the sixth most frequently diagnosed cancer overall [1]. Increased awareness and early diagnosis provides the framework for improved prognosis and survival rates.

Generally, melanoma initiates with the development of either dysplastic or benign nevi which advances to a radial growth phase marked by lateral spread with localization to the epidermis. Transition to the vertical growth phase is marked by invasion into the dermis, subcutaneous tissue and upper epidermis, driven by cells that are anchorage and growth factor independent. The most clinically informative metric for this phase is the Breslow thickness which provides a measure of the thickness of the tumor from the upper layer of the epidermis to the depth of invasion.

To the best of our knowledge, this is the first reported case report of malignant melanoma of the heel among non-fair skinned individuals in the past 40 years. Given that melanomas are rare at this latitude, it is therefore important to report this case and the current clinical and surgical management approaches. This case report was prepared in conformity with the Surgical CAse REport (SCARE) guidelines which provides a framework for accuracy in surgical case reports [2].

2. Case report

We present the case of a 59-year-old female who was evaluated at the Eric Williams Medical Sciences Complex (EWMSC), Trinidad

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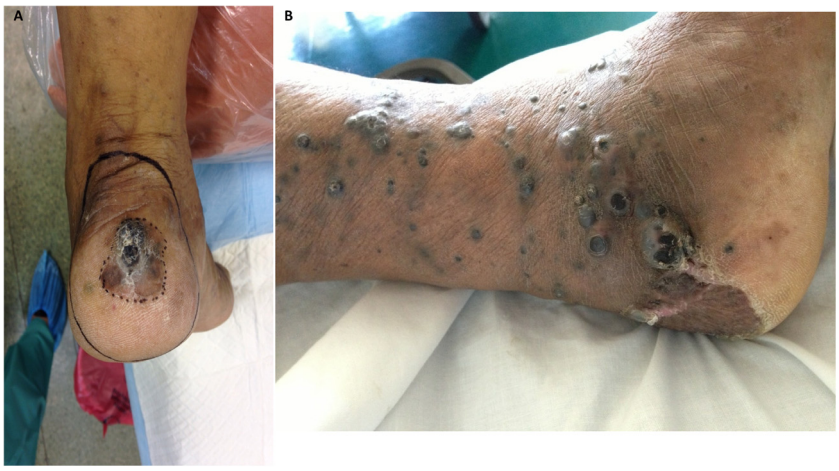

Fig. 1. A 59-year-old female with malignant melanoma. (A). Preoperative assessment of left heel lesion showing (3 cm × 3 cm) area of hyperpigmentation with color variation, ill-defined boarders and variation in symmetry, April 2014. (B). A clinical reoccurrence of the left heel lesion in September 2016 with multiple foci of raised, hyper pigmented lesions scattered throughout the distal third of the left leg and foot. The previous excision site with split-thickness skin graft (STSG) is noted at the posterior aspect of the heel.

and Tobago (TT) for malignant melanoma of the heel. The patient was of mixed ancestry (African and Indian), moderately obese (BMI – 30.6 kg/m^2), and without any family history of cancer. She first consulted a general practitioner then presented at the EWMSC 2 years later with a 5 mm left heel pruritic lesion, which fit the clinical presentation of the "ABCD rule" [3] in that it exhibited Asymmetry, Border irregularities, Color heterogeneity, and Dynamics in colors, elevation, and size (Fig. 1A). The patient recalled that over the preceding 10-year period, the lesion increased in size and was occasionally painful, with no bleeding. Previously, she had an unrelated bilateral tubal ligation and prior treatment with paroxetine (GlaxoSmithKline) for anxiety. She reported excess exposure to sunlight, with no other skin conditions.

She had a left heel punch biopsy to rule out malignant melanoma. The ensuing histopathology report detailed that sections of the skin showed a papillomatoses surface profile with

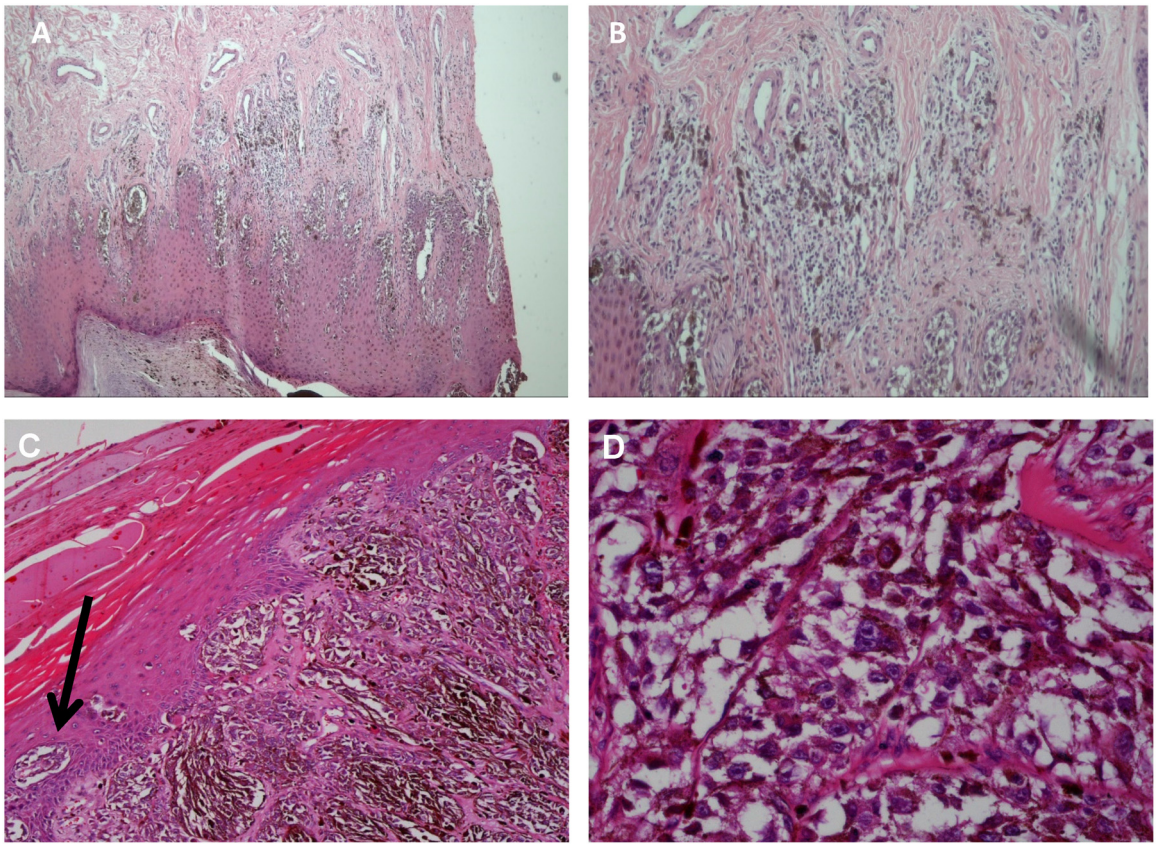

Fig. 2. (A, B). Nevus cells. (A). Type A. Magnification 4× and (B). Type B nevus cells demonstrating Schwannian differentiation. Magnification,10×. (C, D). Microscopic images (H&E) of malignant melanoma. (C). At low magnification (40×), the tumor is noted to comprise nests and sheets of pigmented cells infiltrating deep into the dermis. Foci of nests of intra epidermal tumor epidermal nests are also seen (→). (D). Higher magnification (200×) highlights the atypical tumor cells with prominent nucleoli and "dusty" intracytoplasmic melanin pigment. H & E staining on all panels.

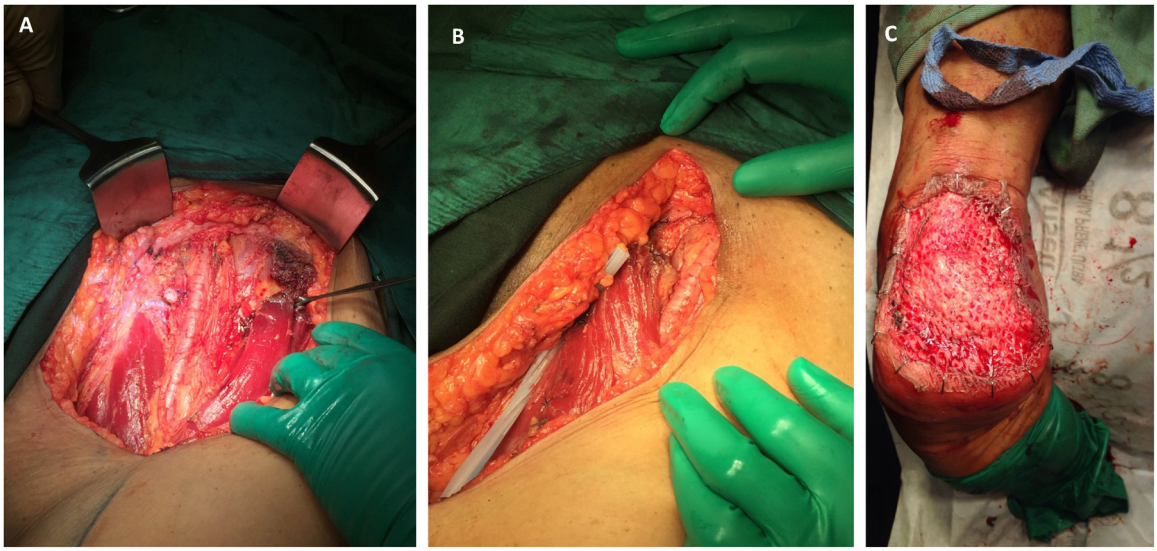

Fig. 3. Intra and postoperative images (A). Intraoperative photograph of left inguinal region after regional lymphadenectomy with exposed femoral artery. Sartorius muscle is seen detached from the anterior superior Iliac spine in preparation for transposition of the muscle flap. (B). Transposed sartorius muscle flap covering femoral artery (C). Postoperative excision of left heel lesion showing depth and width of excision before split-thickness skin graft (STSG).

expansion of the dermis by nests and theques of Type A and Type B nevus cells, which demonstrated schwannian differentiation towards the base of the lesion. Junctional nests were also identified at the tips of elongated rete. With no melanocytic atypia recognized, it was determined that the findings were consistent with a junctional melanocytic nevus (Fig. 2A, B). Four months later, she had a wide local excision (WLE) and full thickness skin graft to the heel lesion with continued care arranged at the out-patient clinic. The surgical site was examined at 1-week and 3-months post excision and appeared to be healing satisfactorily. A year later at her clinic appointment, a reoccurrence of the lesion was noted but she declined further surgical intervention. A month later, during a visit to the plastic surgery out-patient clinic she complained of a painless swelling to the left inguinal area. A 4.0 cm solitary lymph node was identified in the left inguinal region and was noted to be well circumscribed, nodular, mobile and tender, with mild erythema on the overlying skin. The patient was counselled to continue follow-up with the aim of elective surgical intervention.

A multi-disciplinary team representing general surgery, oncology, plastic surgery, and radiology was assembled to manage her case. A decision was made, with curative intent to perform a single stage wide local excision (WLE) of the left heel lesion with a

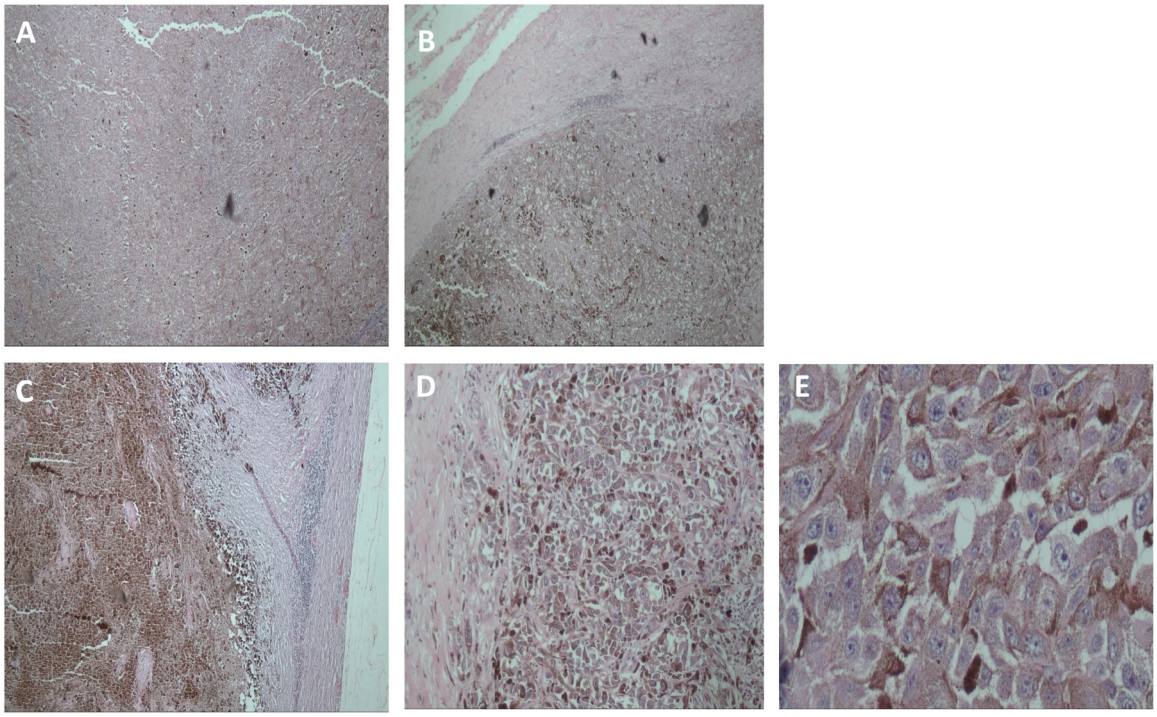

Fig. 4. (A). Lymph node architecture completely effaced by heavily pigmented tumor cells. H&E staining. Magnification, 4×. (B). and (C). Subcapsular and sinusoidal location of pigmented tumor cells. Magnification, 4×. (D, E). Characteristic pleomorphic tumor cells exhibiting vesicular chromatin and prominent eosinophilic macronucleoli. (D). Magnification, 40×. (E). Magnification, 10×.

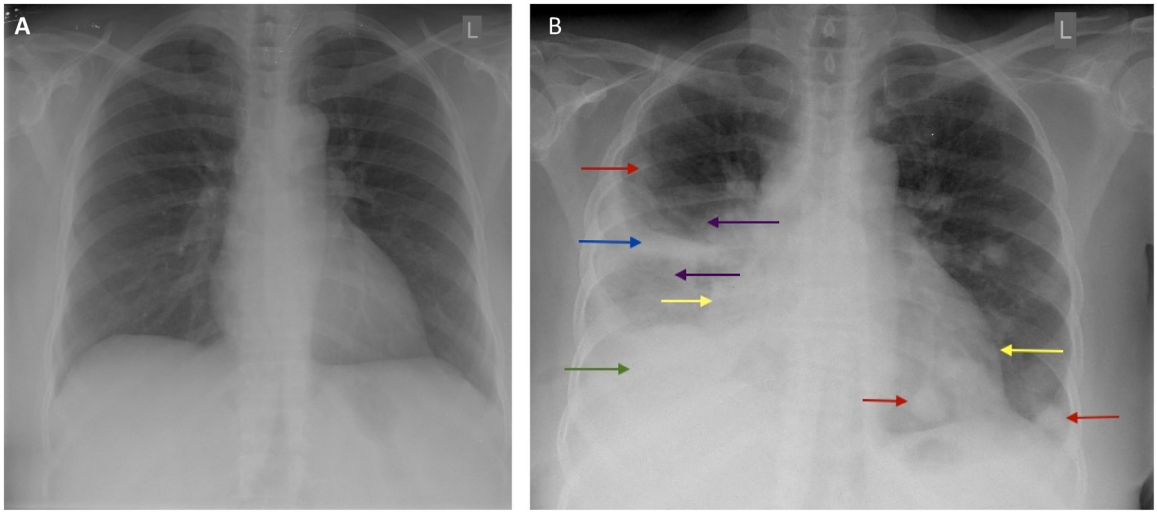

Fig. 5. Patient chest radiographs. (A). Normal posterioranterior chest radiograph from January 2016. (B). posterioranterior chest radiograph 8 months later. Red arrows, multiple bilateral pulmonary nodules with no calcification or cavitation consistent with pulmonary metastases; blue arrow, fluid in right horizontal fissure; green arrow, loculated right pleural effusion; yellow arrows, cardiomegaly; purple arrows, right mid and lower zone consolidation with some obscuration of the right heart border. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

split-thickness skin graft (STSG) and a left inguinal lymphadenectomy with Sartorius transposition (ST) over the femoral vessels. Her preoperative assessments consisting of blood investigations, chest x-ray, electrocardiogram, and computed tomography (CT) of her abdomen, pelvis and brain were unremarkable. A month later, the patient had a lymphadenectomy and a STSG without post-operative complications (Fig. 3A, B, C). She was advised on to start adjuvant therapy immediately but she delayed for 5 months before commencing on Dacarbazine (Bayer) (5 cycles). A month later, on her outpatient follow up at St. James Cancer Treatment Center, TT she had a Grade 0 on the Eastern Cooperative Oncology Group (ECOG) Scale of Performance Status [4].

Three samples from the heel and one from the left inguinal lymph node were examined by the histopathologist. The section from the lymph node showed an effaced architecture of heavily pigmented cells in the subcapsular, sinusoidal and focal capsular pattern with the heavily pigmented cells obscuring the nuclear features (Fig. 4A–C). There were a few areas that showed pleomorphic tumor cells with vesicular chromatin and prominent eosinophilic macronucleoli (Fig. 4D, E). The extracapsular, extra nodal soft tissue and surgical excised margins were negative for tumor deposits. The histological findings from the left inguinal lymph node were consistent with metastatic malignant melanoma. Specimens from the left heel skin (wide local excision), superior heel excision and inferior heel excision yielded similar findings. The Breslow [5] depth was 1.0 cm with Clark [6] anatomical level V (invasion of subcutis) with a mitotic rate of 0.0/mm^2. Guided by standard pathologic assessments, the deep soft tissue and peripheral skin margin were negative at 0.5 cm and 1.0 cm away from the tumor, respectively [7]. There was an absence of tumor infiltrating lymphocytes, ulcerations, lymphovascular invasion and perineural invasion. The histopathological findings was that of malignant melanoma (Fig. 2C, D) at stage pT3a pN1a M0 according to the American Joint Committee on Cancer system (AJCC) 7th edition guidelines [8].

A follow up appointment, six months later revealed the presence of numerous hyper-pigmented lesions scattered throughout her left leg and foot with characteristics similar to that of her initial presentation (Fig. 1B). Arrangements were made to biopsy the existing lesions for histological confirmation of reoccurrence with the possibility of isolated limb perfusion. A month later, she was admitted to EWMSC complaining of shortness of breath and lower back pain. A chest X-ray showed multiple bilateral pulmonary nodules with no calcification or cavitation consistent with pulmonary metastases (Fig. 5A, B). In addition to her hypertension medications, she was placed on Dexamethasone (Decadron, Merck), Nexium (Esomeprazole, AstraZeneca) Morphine, Disprol (Paracetamol) and Tramacet (Janssen). At the time of the manuscript preparation, the patient was provided with an oxygen tank and discharged.

An extensive medical literature search conducted using PubMed/MEDLINE and Embase databases found two case reports detailing malignant melanoma of the heel among non-fair skinned individuals. One study was a review of nine cases of the malignant melanoma of the heel in Puerto Rico (1948–1972) and the other paper from 1972 was not retrievable [9,10].

3. Discussion

For the period 1995–2009, melanomas of the heel, lower limb and hips constituted 0.11% of the reported incident cancer cases in TT (personal communication with the TT Cancer Registry). Globally, the incidence of malignant melanoma is rapidly increasing, particularly, in countries that have had historically low rates [11,12]. In fact, lung cancer in women is the only neoplasm that is growing at a faster rate globally [11]. This shift warrants a greater focus on screening, early diagnosis and expanded precision treatment options among non-fair skin individuals. Many of the genetic events accompanying the development of melanoma have been characterized. It is important that developing countries, like TT build capacity for these genomic profiling and precision medicine approaches to guide treatment algorithms and reduce the cancer burden [13].

Like many developing countries, TT does not have extensive nuclear medicine capabilities including positron emission tomography/computed tomography (PET/CT) systems. As the shift in the morbidity and mortality burden occurs towards chronic and non-communicable diseases, there is greater need to include PET/CT in the diagnostic arsenal.

Despite the fact that TT offers free universal health care and that melanoma is widely considered to be one of the more preventable cancer types, the patient did not seek treatment for 10 years post initial observation of skin change. The lesions of the majority of patients with cutaneous melanoma were initially detected by the patient themselves on self-examination (44%) or by their spouse (18.6%) with primary care provider (PCP) detection account-

ing for 25% [14,15]. It is therefore important to emphasize public awareness and PCP awareness of the "ABCD Rule" to ensure earlier detection of cutaneous melanomas [3,15,16]. While screening programs have utility, they can be an economic burden in developing countries with low melanoma incidence. One approach utilizes innovative information technology and mobile phone usage in an application described as mobile teledermoscopy [17]. While it is not a substitute for a physical consultation with a PCP, it provides a cost effective approach to early detection of melanomas in patients who might otherwise go undiagnosed and in regions where a screening program is not economically feasible.

In the management of this case, there were numerous instances where the patient failed to adhere to the treatment protocol. While some potential strategies have been reviewed elsewhere [18], there is need for research on patient non-adherence in developing countries as well as country specific strategies to increase adherence.

4. Conclusion

Given the increasing rate of malignant melanomas among non-fair skin individuals, this case highlights the need for increased public awareness, early diagnosis and the importance of clinical decision making through a multi-disciplinary team approach.

Conflicts of interest

None.

Ethical approval

Ethical approval was not required since patient was de-identified.

Consent

Consent provided.

Author contribution

The operation was carried out by Ravi Maharajamd Dave Harnanan. Pathology services performed by Srikanth Umakanthan and Wesley Greaves. Kevin Sarran and Lemuel Pran contributed to the clinical management of the patient. The radiological imaging studies were reported and managed by Maurice Fortune with plastic surgery by Sharda Narinesingh. VandanaSookdeo assisting in critical discussions. Wayne A. Warner wrote the manuscript. All authors approved the final version.

Guarantor

Wayne A. Warner, VandanaDevikaSookdeo, Srikanth Umakanthan, Kevin Sarran, Lemuel Pran, Maurice Fortuné, Wesley Greaves, Sharda Narinesingh, Dave Harnanan, Ravi Maharaj.

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References

[1] F. Erdmann, et al., International trends in the incidence of malignant melanoma 1953–2008–are recent generations at higher or lower risk? Int. J. Cancer 132 (2013) 385–400, http://dx.doi.org/10.1002/ijc.27616.
[2] R.A. Agha, et al., A protocol for the development of reporting criteria for surgical case reports: the SCARE statement, Int. J. Surg. (Lond., Engl.) 27 (2016) 187–189, http://dx.doi.org/10.1016/j.ijsu.2016.01.094.
[3] R. Dummer, et al., The updated Swiss guidelines 2016 for the treatment and follow-up of cutaneous melanoma, Swiss Med. Wkly. 146 (2016) w14279, http://dx.doi.org/10.4414/smw.2016.14279.
[4] M.M. Oken, et al., Toxicity and response criteria of the Eastern Cooperative Oncology Group, Am. J. Clin. Oncol. 5 (1982) 649–655.
[5] A. Breslow, Thickness, cross-sectional areas and depth of invasion in the prognosis of cutaneous melanoma, Ann. Surg. 172 (1970) 902–908.
[6] W.H. Clark Jr., L. From, E.A. Bernardino, M.C. Mihm, The histogenesis and biologic behavior of primary human malignant melanomas of the skin, Cancer Res. 29 (1969) 705–727.
[7] N.M. Price, A.M. Rywlin, A.B. Ackerman, Histologic criteria for the diagnosis of superficial spreading malignant melanoma: formulated on the basis of proven metastatic lesions, Cancer 38 (1976) 2434–2441.
[8] S.B. Edge, C.C. Compton, The American Joint Committee on Cancer: the 7th edition of the AJCC cancer staging manual and the future of TNM, Ann. Surg. Oncol. 17 (2010) 1471–1474, http://dx.doi.org/10.1245/s10434-010-0985-4.
[9] B. Bentley-Phillips, M.A. Bayles, Melanoma and trauma: a clinical study of Zulu feet under conditions of persistent and gross trauma, S. Afr. Med. J. 46 (1972) 535–538.
[10] E. Pantoja, R.E. Llobet, B. Roswit, Melanomas of the lower extremity among native Puerto Ricans, Cancer 38 (1976) 1420–1423.
[11] L.A. Ries, et al., The annual report to the nation on the status of cancer, 1973–1997, with a special section on colorectal cancer, Cancer 88 (2000) 2398–2424.
[12] S.N. Markovic, et al., Malignant melanoma in the 21st century, part 1: epidemiology, risk factors, screening, prevention, and diagnosis, Mayo Clin. Proc. 82 (2007) 364–380, http://dx.doi.org/10.4065/82.3.364.
[13] A. Roach, W.A. Warner, A.A. Llanos, Building capacity for human genetics and genomics research in Trinidad and Tobago, Rev. Panam. Salud Publica 38 (2015) 425–430.
[14] W.R. Heymann, Screening for melanoma, J. Am. Acad. Dermatol. 56 (2007) 144–145, http://dx.doi.org/10.1016/j.jaad.2006.08.046.
[15] S. Hajdarevic, M. Schmitt-Egenolf, C. Brulin, E. Sundbom, A. Hornsten, Malignant melanoma: gender patterns in care seeking for suspect marks, J. Clin. Nurs. 20 (2011) 2676–2684, http://dx.doi.org/10.1111/j.1365-2702.2011.03788.x.
[16] M.A. Weinstock, et al., Downstream consequences of melanoma screening in a community practice setting: first results, Cancer (2016), http://dx.doi.org/10.1002/cncr.30177.
[17] C. Massone, et al., Melanoma screening with cellular phones, PLoS One 2 (2007) e483, http://dx.doi.org/10.1371/journal.pone.0000483.
[18] L.R. Martin, S.L. Williams, K.B. Haskard, M.R. Dimatteo, The challenge of patient adherence, Ther. Clin. Risk Manag. 1 (2005) 189–199.