Single Case

Basal Cell Carcinoma on the Sole: An Easily Missed Cancer

Natalie L. Hone Radhika Grandhi Adam A. Ingraffea

Department of Dermatology, University of Cincinnati, Cincinnati, Ohio, USA

Keywords

Cancer screening · Basal cell carcinoma · Skin cancer

Abstract

Basal cell carcinoma (BCC) is the most common skin cancer, and solar ultraviolet ray exposure is the most significant risk factor for its development. The plantar foot is infrequently exposed to the sun, thus the presence of BCC on the sole is rare. We report a case of BCC on the sole of the foot and its treatment in the hope to facilitate its detection.

© 2016 The Author(s)
Published by S. Karger AG, Basel

Case Presentation

A 69-year-old Caucasian woman with a history of multiple non-melanoma skin cancers presented with a 1-month history of a painful, bleeding lesion on her left plantar foot. She denied recent trauma or artificial irradiation to the area. Physical examination showed a 1.5-cm, well-circumscribed, pink, eroded, crusted plaque on her left plantar foot (fig. 1). There were no palmar or plantar pits. The regional lymph nodes were not enlarged, and the rest of the skin examination was unremarkable.

A shave biopsy was performed, and histopathological examination showed nodular and micronodular basal cell carcinoma (BCC) with tumor islands displaying prominent palisading, focal retraction clefting, and moderate cellular pleomorphism (fig. 2). Immunohisto-

chemical stains revealed that the tumor cells were positive for CK5/6 and BerEp4. The lesion was surgically excised using Mohs micrographic surgery under local anesthesia. The intra-operative frozen section confirmed the presence of BCC.

Discussion

Sun exposure is the most significant risk factor for the development of BCC, the most common skin cancer [1], and it most commonly presents on the face and neck. There are fewer than 40 cases of BCC reported on the foot, accounting for less than 1% of all cases [2]. The etiology of BCC on the sole is controversial. One of the leading thoughts is that BCC tumor cells originate from the cells of the outer root sheath or the follicular bulge region of the hair follicle [3–5]. However, a follicular origin of BCC would not explain its appearance on the sole of the foot given that only glabrous skin is found on palms and soles. An alternative hypothesis describes malignant transformation of immature pluripotent epithelial cells analogous to eccrine sweat-gland germ cells [2, 5, 6]. We favor this cell lineage as the proposed origin of BCC in our patient, given the characteristics of the plantar foot.

The differential diagnosis for a non-healing papular lesion on the foot includes trauma, bacterial, fungal, or viral infection, and malignancy. The diagnosis is confirmed via biopsy with characteristic histologic findings of tumor islands composed of small cells with uniform round or oval darkly staining nuclei and minimal cytoplasm with a peripheral palisading pattern. Immunohistochemical staining can further determine a lesion as BCC. BCCs express epithelial cell adhesion molecule (BerEp4) [2] as well as bcl-2, CD10, SOX9, and p53. They also show a cytokeratin expression profile analogous to that of follicular epithelium in the hair bulge. Treatment options include surgical excision, curettage, Mohs micrographic surgery, radiation therapy, or medical treatment with topical 5-fluorouracil or imiquimod for superficial BCCs.

The rarity of plantar BCC, compounded by the atypical clinical appearance, makes this an easily misdiagnosed entity that can have increased morbidity if there is a significant delay in diagnosis. We urge physicians to perform a thorough examination of the palms and soles in patients when performing a skin exam and to keep BCC in the differential diagnosis of a bleeding, pruritic, or non-healing lesion on the sole of the foot.

Statement of Ethics

This study complies with guidelines for human studies. The subject has given informed consent.

Disclosure Statement

The authors declare no conflicts of interest. There was no funding for this work.

References

- 1 Quach OL, Barry M, Cruse AR, Wilson BB: 'Basal cell blanche': a diagnostic maneuver to increase early detection of basal cell carcinomas. *J Am Board Fam Med* 2016;29:408–410.
- 2 Kiyohara T, Ido T, Hatta N, Kawami K, Kumakiri M: Basal cell carcinoma with an epidermal collarette and ductal differentiation on the dorsal foot. *J Dermatol* 2012;39:1031–1032.
- 3 Roewert-Huber J, Lange-Asschenfeldt B, Stockfleth E, Kerl H: Epidemiology and aetiology of basal cell carcinoma. *Br J Dermatol* 2007;157:47–51.
- 4 Sellheyer K, Krahl D: Basal cell (trichoblastic) carcinoma. Common expression pattern for epithelial cell adhesion molecule links basal cell carcinoma to early follicular embryogenesis, secondary hair germ, and outer root sheath of the vellus hair follicle: a clue to the adnexal nature of basal cell carcinoma? *J Am Acad Dermatol* 2008;58:158–167.
- 5 Ee HL, Tan SH, Kumarasinghe SP: Plantar basal cell carcinoma: a possible eccrine origin. *Clin Exp Dermatol* 2004;29:678–679.
- 6 Smullen MJ, Bertler DE: Basal cell carcinoma of the sole: possible association with the shoe-fitting fluoroscope. *WMJ* 2007;106:275–278.

Fig. 1. Physical examination showed a 1.5-cm, well-circumscribed, pink, eroded, crusted plaque on the patient's left plantar foot.

Fig. 2. Nodular and micronodular BCC with tumor islands displaying prominent palisading, focal retraction clefting, and moderate cellular pleomorphism. H&E. ×4.