

Development of poorly differentiated invasive squamous cell carcinoma in giant Bowen's disease: a case report with dermatoscopy

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ABSTRACT Bowen's disease (BD) is an *in situ* form of squamous cell carcinoma (SCC), often occurring in the chronically UV-damaged skin of elderly people. The risk of progression of BD to invasive SCC varies between 3% and 5%, and one-third of invasive tumors may metastasize. Herein we discuss the dermatoscopic findings of a case of giant Bowen's disease, which progressed to poorly differentiated invasive SCC.

Introduction

Bowen's disease (BD) is an *in situ* variant of cutaneous squamous cell carcinoma (SCC). Etiological factors for BD include ultraviolet radiation (solar, iatrogenic and sunbeds) [1,2], radiotherapy, carcinogens (arsenic), immunosuppression [3,4], and infection with human papillomavirus [5-7]. Histopathologically it is characterized by abnormal and pleomorphic keratinocytes that in the precursor stages involve only the lower part of the epidermis and, in time, with progression to BD, the full thickness of it. Dermatoscopic criteria have

been described for pigmented and non-pigmented BD, actinic keratosis (AK) and superficial forms of SCC [8-10]. A recent study has focused on a progression model of actinic keratosis and intraepidermal carcinomas to invasive carcinoma but was limited to facial cases [10].

Case report

A 44-year-old male presented with a 10-year history of a 35x25 cm erythematous hyperkeratotic, crusted, and ulcer-

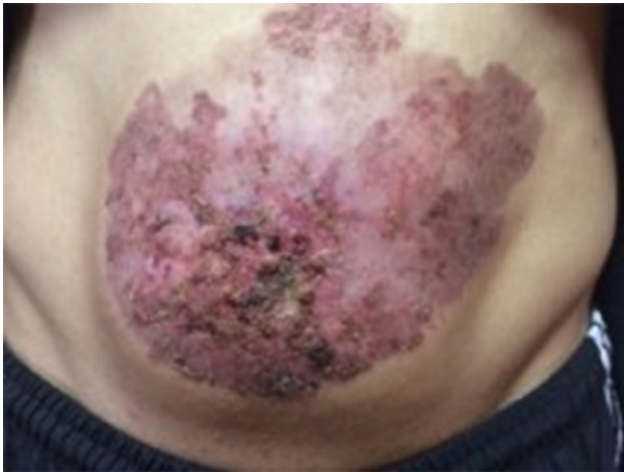


Figure 1. Clinical image of the patient showed a 35x25 cm erythematous hyperkeratotic, crusted, and ulcerated plaque on the abdominal region. [Copyright: ©2016 Akay et al.]

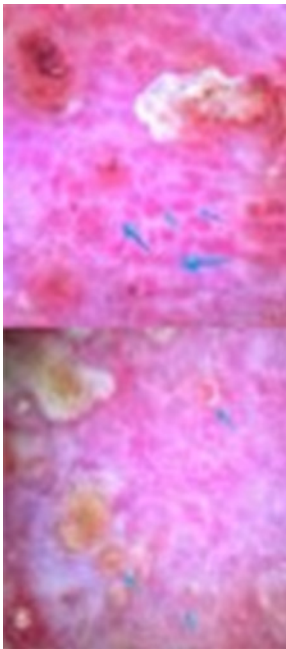


Figure 2. Dermatoscopy of the central region. (A) Linear arrangement of coiled vessels becoming convoluted and larger in size (blue arrows) intermingled with ulceration and adherent fibrin crusts. (B) White circles (blue arrows). [Copyright: ©2016 Akay et al.]

ated plaque on his abdominal region (Figure 1). The patient did not report previous history of trauma, immunosuppression or radiotherapy to the lesion site.

Dermatoscopic examination of the central part of the lesion with DermLite Pro HR (3Gen, LLC, San Juan Capistrano, CA, USA) mounted on an iPhone 5S®, revealed white circles and a vascular pattern, observed as large coiled vessels in linear arrangement intermingled with ulcerations and adherent fibrin crusts (Figure 2).

The peripheral parts showed a linear arrangement of gray dots and coiled vessels without prominent white circles and ulceration (Figure 3).

The diameter of the coiled vessels on the central part was larger in size than seen in the periphery. In addition, red and white structureless areas were distributed throughout the

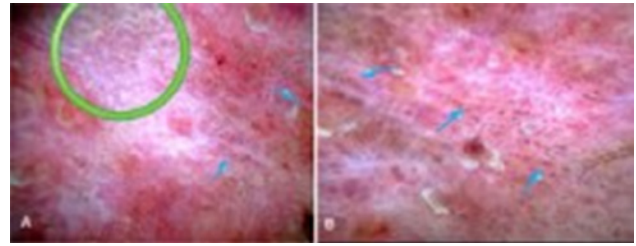


Figure 3. Dermatoscopy the peripheral region. (A, B) White and pink structureless areas, white lines (green circle) and a linear arrangement of gray dots and coiled vessels (blue arrows). No ulceration or white circles are seen. [Copyright: ©2016 Akay et al.]

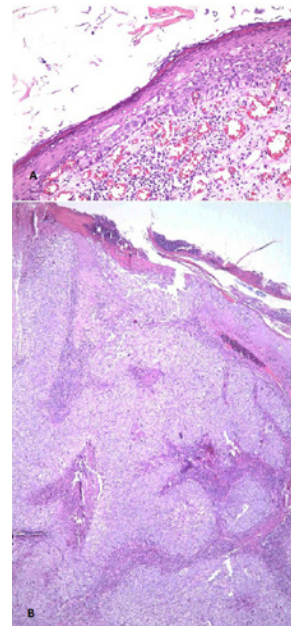


Figure 4. (A) Histopathology of the peripheral part which is consistent with BD: An acanthotic epidermis shows full-thickness epidermal replacement by crowded keratinocytes that demonstrate disordered dysplasia, lack of maturation, atypical mitotic figures and nuclear pleomorphism with hyperchromasia. A band-like lymphocytic infiltrate is apparent in the papillary dermis. (B) Histopathology of the central region shows invasive part of tumor which extends as invasive broad tongues into the dermis. This part of the tumor composed of pleomorphic atypical epithelioid cells with high nucleocytoplasmic ratio and frequent mitosis. Squamous differentiation features, such as squamous pearls or single cell keratinization, are not obvious. Foci of necrosis can be noted at the right part of the figure. [Copyright: ©2016 Akay et al.]

whole lesion. Multiple skin biopsies from the peripheral and central parts were taken. Central parts were histopathologically consistent with poorly differentiated invasive SCC, while peripheral parts were compatible with BD (Figure 4). There were no cytopathic changes compatible with human papillomavirus infection. The patient's arsenic level was found to be elevated on blood analysis.

Thoracic-abdominal-pelvic computed tomography did not show any metastasis. The lesion was totally excised with safe surgical margins and split-thickness skin grafting was performed in the plastic surgery department.

Discussion

Discussion

Bowen's disease (BD) can be considered a low-grade form of SCC, with the majority of studies reporting the risk of progression to SCC at 3-5% [12,13]. Despite the low incidence of malignant progression, BD has significant consequences since

approximately 20% of the tumors that develop into SCC will eventually become metastatic [12]. Therefore, patients with BD should be diagnosed and treated as early as possible.

Dermatoscopy is considered a helpful and non-invasive tool for increasing the diagnostic accuracy of BD. In 2004, Zalaudek et al., described dermatoscopic features of BD in 21 cases [8]. They observed a particular type of vascular pattern in BD, named glomerular vessels, a variant form of dotted vessels that are large in size and often grouped and regularly arranged in clusters, mimicking the glomerular apparatus of the kidney. They emphasized that the “glomerular” vessels together with a scaly surface and, in cases of pigmented BD, the additional presence of pigmented small globules and/or homogeneous pigmentation, represent specific dermatoscopic criteria for the diagnosis of BD. In their study glomerular vessels were observed in 100% of the non-pigmented and 80% of the pigmented BD. This special type of tortuous capillary was histopathologically correlated to a convolution of grouped, frequently dilated capillaries in the dermal papillae and papillary dermis [8]. In 2010, Cameron et al., described dermatoscopic findings of pigmented BD, and they found that the linear arrangement of brown and/or gray dots and/or coiled vessels were specific clues to pigmented BD [9]. Pink, white or skin-colored structureless areas were found to be the most common finding in their study. Histopathologically, the brown to gray dots in BD may correspond to the presence of melanophages arranged in clusters and diffusely situated in the superficial dermis, and/or to a slightly increased number of pigmented keratinocytes in the basal layer and less frequently in suprabasal locations. Dermatoscopy of SCC has been the subject of very recent studies.

Zalaudek et al., proposed a progression model of facial AK developing into BD and invasive SCC based on dermatoscopic findings [10]. In this model, those AK that progress to increasing atypia tend to display vessels around follicles that become dotted (or coiled on higher magnification), then as the lesion develops into SCC in situ the dotted/coiled vessels appear to enlarge, become more convoluted and clustered, and the follicles in that area appear to miniaturize and disappear eventually forming the discrete whitish, opaque scaly areas. With progression of BD to invasive SCC, looped and/or linear irregular vessels will appear, and a central mass of keratin forms and ulceration may occur [10]. White circles, keratin, and blood spots were the strongest features associated with the diagnosis of SCC in a recent study by Rosendahl et al [14]. Especially, white circles were useful clues to differentiate SCC and keratoacanthoma from other raised non-pigmented skin lesions by dermatoscopy. White circle is a new dermatoscopic criterion, represented by white circles centered around a dilated infundibulum filled with a keratin plug that is visible as a yellow or an orange clod on dermatoscopy. White circles correspond to acanthosis and hypergranulosis

in the infundibular epidermis, which in effect is invasion of adnexa and can be a feature of well-differentiated SCC. The white circles observed in our case were poorly formed and sparse which may be associated with the poor differentiation status. In the present case, the periphery of the lesion corresponding to BD showed gray to brownish dots and coiled vessels arranged in lines, while the central part corresponding to invasive SCC revealed white circles, large coiled vessels arranged in lines and ulceration. The diameter of the coiled vessels on the central part was larger in size than seen on the periphery, similar to the progression model of Zalaudek et al [10]. In addition, white circles and ulceration were not observed on the parts where there was BD. Rosendahl et al., found the positive predictive value of white circles as 92% in SCC when compared with BD [14].

In conclusion, we have presented the first description of dermatoscopic findings of poorly differentiated invasive SCC developing on a huge BD. Dermatoscopy may help to differentiate intraepidermal carcinoma from invasive SCC, especially when confronted with white circles and coiled vessels with large diameter. This in turn may help clinicians not only to diagnose in situ or invasive lesions but also to improve the selection of lesions requiring biopsy or excision for definitive histopathologic diagnosis.

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