Case Report

Treatment of Actinic Keratoses Facilitates Dermatoscopic Diagnosis of Early Basal Cell Carcinoma: A Case Report and Review

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Abstract
Chronic exposure to ultraviolet radiation induces gradual changes in cutaneous morphology, which with increasing damage leads to the appearance of cancerous skin lesions. Among them, basal cell carcinomas (BCCs) and actinic keratoses (AKs) are the most common entities. Both lesions often develop as two separate lesions in a single individual at a conspicuous distance, close proximity or as collision lesions, which are characterized by the coexistence of both cancers in the same anatomical site. Collision lesions in which AK precisely overlies BCC is a rarely reported entity. We report a case where the presence of BCC was dermatoscopically detected after an overlying AK was treated with topical chemotherapy, thus indicating that treatment of AK allows better visualization of other underlying malignancies.

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Introduction

Actinic keratoses (AKs), which can be considered as squamous cell carcinomas (SCCs) in situ, and basal cell carcinomas (BCCs) are the most common ultraviolet radiation-induced keratinocyte skin cancers with high and continuously increasing prevalence. Recent European studies have estimated that AKs affect 25.3% of outpatients above the age of 30 years visiting a dermatologist or a general practitioner [1, 2]. Similarly, the incidence of BCCs is increasing every year with the cumulative risk in Belgium assessed as 11% before the age of 75 years [3, 4]. Both AK and BCC share a substantial amount of environmental and individual risk factors including ultraviolet radiation, fair skin, low ability to tan, higher age, male sex, personal or family history of skin cancer and immunosuppression [1, 3, 5, 6]. Both are markers of cutaneous photodamage and the presence of AK and BCC in a single individual is not uncommon; moreover, the presence of AK has been shown to increase the risk of BCC by approximately 3 times [7].

Dermatoscopy is a noninvasive, widely used real-time diagnostic imaging technique, which renders magnification and translucency of the corneal layer, thus visualizing structures unseen with the naked eye. Dermatoscopy has been shown to improve diagnostic accuracy of pigmented and nonpigmented skin lesions. In the case of AKs, a sensitivity of 98.7% and specificity of 95.0% has been reported [8]. Similarly, for BCC a sensitivity of 95–98.6% and a diagnostic probability of as high as 99% has been reported [9, 10]. Additionally, even in clinically ambiguous cases where BCC and SCC have been inversely misdiagnosed, dermatoscopy yields an odds ratio of 2.9 for the correct diagnosis [11]. The latest updated version of dermatoscopic criteria associated with BCC consist of 12 features describing pigment structures (6), vessel morphology (2), surface characteristics (2), and background structures correlating with dermal fibrosis (2). The criteria can be present in different combinations showing the dermatoscopic variability of BCC [12]. More signs and features can be found in the literature but are less commonly used [13].

Both AK and BCC can cause high morbidity and treatment costs, especially if diagnosis and treatment is delayed thus allowing BCC to increase in size and possibly to a more aggressive subtype [14, 15] and AK to progress towards invasive SCC. Therefore, early diagnosis and management has a crucial role.

We report a case where the diagnosis of BCC was dermatoscopically possible after treatment of overlying AK.

Case Report

An 87-year-old fair-skinned (type II according to Fitzpatrick) female patient with no previous history of nonmelanoma skin cancer presented with multiple AKs on the facial skin. Lesions had been present for approximately 5 years. On clinical assessment, 20 AKs were identified, corresponding to 5.2 on the Actinic Keratosis Area and Severity Index [16] and 2 on the Actinic Keratosis Field Assessment Scale [17]. Before the therapy and during follow-up visits, all lesions were dermatoscopically assessed (polarized light contact dermoscopy) and digital images were taken with the FotoFinder Systems GmbH medicam 1000 device. One of the AKs on the left cheek showed a most inconclusive dermatoscopic picture and therefore was biopsied to exclude minimally invasive SCC. The histology showed AK grade III, parakeratosis, and lichenoid infiltration. No atypical mitoses were present. Treatment with 5% 5-fluorouracil cream was initiated according to the treatment guidelines and a follow-up visit was set after
2 weeks. At that point, treatment had resulted in expected inflammatory response with erythema, erosions, mild crusting, some scaling and dermatoscopically seen peppering. A lesion on the nose that had previously shown a keratin mass and was considered as a hypertrophic AK (Fig. 1) now dermatoscopically consisted of two parts (Fig. 2). On the upper left side, a diffuse erythema, several plugged and targetoid hair follicles, and a whitish brown scale was present, while on the lower right side, short fine radially distributed linear and some branched vessels were visible. Therapy was continued for 1 more week and a follow-up visit was scheduled at 4 weeks following treatment. Then naked-eye examination showed slight depression and, apart from the previously pictured plugged hair follicles, short fine telangiectasia; some arborizing vessels with a small diameter and crystalline structures were visible on a translucent structureless background (Fig. 3). All of the present structures fulfill the dermatoscopic criteria for nonpigmented BCC. Cryodestruction of the newly diagnosed BCC was performed. At the posttreatment follow-up visit, the patient was clinically and dermatoscopically assessed by the treating physician as cleared of the BCC.

Discussion/Conclusion

This case report shows that treatment of AKs allows better clinical and dermatoscopic visualization of other nonpigmented skin tumors and therefore earlier diagnosis and treatment is possible. It can be considered as an additional treatment advantage apart from the well-known cosmetic benefit to the patient and possibly protection from the development of invasive SCC.

Historically the presence of collision lesions in dermatology has been reported by many authors, though AK and BCC was not among the most common combinations [18]. A more recent publication by Blum et al. [19] showed collision lesions between AK and BCC in 2 of 35 collision lesions with a BCC component. Side-by-side collision lesions between AK and BCC by some authors is considered a routine. Nevertheless, collision lesions in which AK precisely overlies BCC are a rarely reported entity. A study by Sambandan et al. [20] reported 8 cases in a 10-year period where biopsy of the superficial portion of the lesion was read as AK or SCC in situ, while deeper biopsy or surgery revealed infiltrative or nodular BCC. In reviewing the literature, we did not find another case where a BCC would have been dermatoscopically detected in a treatment follow-up of an overlying AK.

Some publications state possible progression from AK to BCC, though this idea is not generally accepted. For instance, Criscione et al. [21] observed that 36% of all primary BCCs in high-risk patients with previous nonmelanoma skin cancer arose in lesions that were previously clinically diagnosed as AKs. There is a possibility that the use of dermatoscopy would have increased the accuracy of clinical diagnosis as shown by Ryu et al. [11], who also concluded that BCC may be clinically misdiagnosed as SCC in the presence of scaling.

Three of the dermatoscopic criteria associated with BCC according to the latest updated criteria version were seen in this case – superficial fine telangiectasia, some arborizing vessels with small diameter, and crystalline structures [12]. An additional criterion, translucency, was also present. The named criteria are in consistency with the lesion being an initial BCC before the development of more common criteria according to the known correlations between dermatoscopic and morphological signs [22–27]. In particular, superficial fine telangiectasia and arborizing vessels with a small diameter have been associated with superficial BCCs [25, 26]. Translucency, also called semitranslucency, that can be seen both clinically and dermatoscopically as near-skin-tone colored, smooth, jellylike appearance has been suggested as a
dermatoscopic sign of early BCCs measuring only 3–4 mm in diameter [22, 23]. Histologically translucency has been associated with verified nodular and morpheaform types of BCC [13]. Crystalline, also named chrysalis structures or shiny white streaks, represents collagenous stroma and fibrosis in the dermis [27]. In this case, we cannot exclude that crystalline structures could have appeared due to the treatment with 5% 5-fluorouracil cream. Absence of dermatoscopic pigment structures in this case is not unexpected, as they are more common in darker skin types [12, 28].

The treatment of AK in this case was indicated from the patient’s perspective due to cosmetic burden and subjective symptom of slight prickling. From the physician’s point of view, the patient was considered as a high-risk patient due to the high AK count (n = 20) on clinical examination. As shown by Green et al. [29], the relative risk of developing invasive SCC is increased by 5–6 times, if up to 20 AKs are present. The risk for developing a BCC is increased by up to 5 times if AK count exceeds 10 [7].

The patient was very content with the AK treatment result, although application site reactions were moderately acceptable.

The strength of this case report was the use of digital dermatoscopy on all AKs before, during and after the treatment and that the computer-aided method, which incorporates clinical and dermatoscopic pictures, allowed the same spot to be captured at every visit.

The limitation of this case was that a biopsy was not done on the newly developed BCC and histopathological subtype was not assessed. Dermatoscopic assessment of all AKs with treatment follow-up in a larger patient sample could identify more cases.

**Statement of Ethics**

The authors have no ethical conflicts to disclose.

**Disclosure Statement**

The authors have no conflicts of interest to declare.

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**Fig. 1.** Dermatoscopic image of a lesion on the nose clinically diagnosed as a hyperkeratotic actinic keratosis.
Fig. 2. Dermatoscopic image of the lesion after 2-week treatment with 5% 5-fluorouracil cream.

Fig. 3. Dermatoscopy of the lesion at a posttreatment follow-up visit. A translucent hue with short fine linear and branched vessels and shiny white streaks are seen.