

# Dermoscopic-pathologic Correlation of Bowen Disease: A Case Series and Review of the Literatures

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## Abstract

**Introduction:** We report the dermoscopic and pathologic features of the four patients with Bowen disease, an insitu squamous cell carcinoma, to assess the correlation of the pathologic-dermoscopic features of the Bowen disease.

**Materials and Methods:** Dermoscopic images of all cases including nine lesions of the four patients were obtained by means of microderm. The images were analyzed by two experienced observer for searching global and local dermoscopic features. Four of nine lesions were excised and submitted for histopathologic examination.

**Results:** The most frequently occurring dermoscopic features were found to be: glomerular vessels (88.8%), gray to brown pigmentation (77.7%), scaling (55.5%), homogenous pigmentation (55.5%) and pigmented steak (22.2%). The histopathological evaluation of all cases revealed the dysmaturation of the keratinocytes, keratinocytic atypia and irregular psoriasiform acanthosis. In dermoscopic-histopathologic correlation, all lesions showed glomerular vessels in dermoscopy except one of the lesions.

**Conclusion:** Dermoscopy may be considered as a helpful diagnostic test for the bowen disease to rule out other differential diagnosis. The microscopic slide may not be completely representative of the dermoscopic features, therefore, serial sections could be ordered. Further study is needed to assess the specificity and sensitivity of the dermoscopic criteria in differentiating BD from other pigmented and nonpigmented skin tumors as well as from inflammatory skin disorders.

**Keywords:** Dermoscopic; Bowen disease; Case series; Pigmented skin lesions

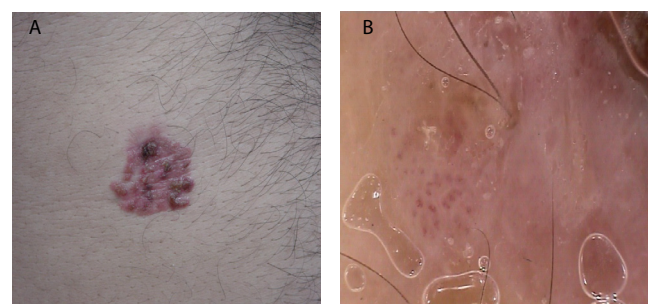
## Introduction

Bowen disease (BD) is an in situ squamous cell carcinoma that is usually nonpigmented but it may also rarely be pigmented, resembling in a few instances as a melanoma [1,2]. Dermoscopy improves the diagnostic accuracy in pigmented skin lesions, but it is also useful in the evaluation of nonpigmented skin tumours as it allows the recognition of vascular structures that are not visible to the naked eye. Bowen's disease (BD) or squamous cell carcinoma in situ is usually nonpigmented, but may also rarely be pigmented. Several dermoscopic algorithms have been proposed to diagnose pigmented skin lesions accurately [3-5] but there is paucity of data with regard to the applications of dermoscopy for evaluation of BD. We report the dermoscopic and pathologic features observed in nine lesions from four cases of pigmented BD (PBD) and nonpigmented BD (NPBD).

## Report of cases

**Case 1.** A 52 years old man was presented to our clinic with an erythematous plaque on the trunk since 4 years ago. Clinical examination revealed a single 3 × 2.5 cm<sup>2</sup> plaque with erythematous background and rough surface with a few slightly elevated dark papules (Figure 1A). Dermoscopic examination showed a scaly surface, small brown globules packed in a patchy distribution, brown homogeneous pigmentation, and a peculiar pattern of vessels (glomerular type) in a patchy distribution (Figure 1B).

**Case 2.** A 68 years old man with an erythematous plaque measured 3 × 2.5 cm<sup>2</sup> on the leg presented to our clinic. In examination, there was a non-pigmented plaque, partially covered by crust, having sharp



**Figure 1:** (A) Erythematous plaque of the trunk with rough surface and slightly-elevated dark papules; (B) Small brown globules packed in a patchy distribution and a peculiar pattern of vessels (glomerular type).

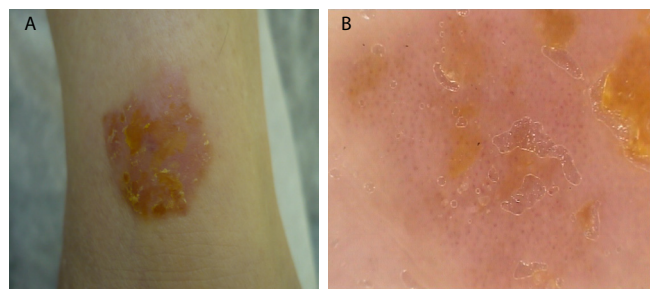
margin (Figure 2A). Dermoscopy revealed dot-like glomerular vessels embedded in an erythematous background. No homogenous or dotted pigmentation has been identified (Figure 2B).

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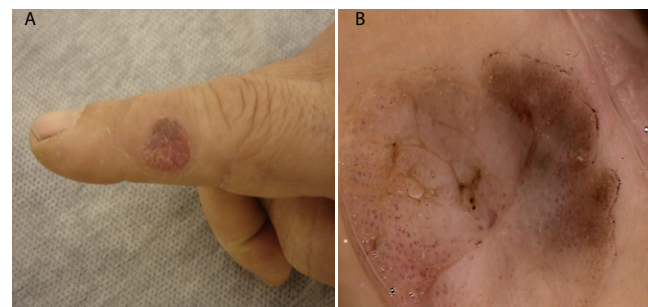
**Figure 2:** (A) Non-pigmented plaque on the leg with sharp margin partially covered by crust; (B) Dot-like glomerular vessels embedded in an erythematous background.

**Case 3.** A 46 years old man with an erythematous partially pigmented plaque measured  $1 \times 1 \text{ cm}^2$  on second hand finger presented to our clinic (Figure 3A). In dermoscopic examination, there were a distinct glomerular vessels and patchy dotted brown globules embedded in a structure-less pigmented background. Pigmented streak or crypt also identified (Figure 3B).

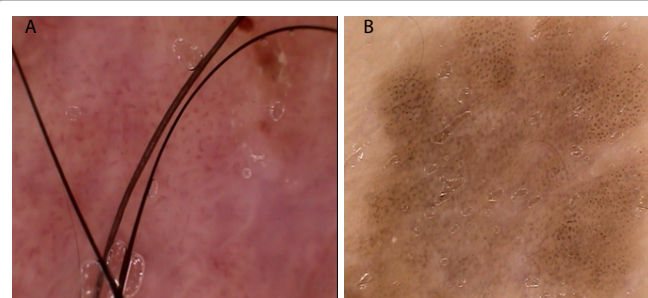
**Case 4.** A 72 years old man presented to our clinic with six erythematous scaling and pigmented plaques on trunk, back and front. He was a sweeper with punctate keratosis of the palms suggestive of Arsenical exposure. Dermoscopic examinations in all lesions except one (No 6), peculiar glomerular vessels and dotted pigmentation were distributed on a homogenous pigmented background (Figure 4A). All lesions except one (No 7) were presenting clustered brown globules. Three lesions revealed focal hypopigmentation (Figure 4B).

## Dermoscopic methods

Dermoscopic images of all cases were obtained by means of Microderm (Visiometer, Germany) with a 10 and 30-fold magnification of the image. Dermoscopic images were analyzed by two experienced observer (HG, HM) applying the modified pattern analysis, searching for global and local dermoscopic features. Four lesions from nine lesions were excised and submitted for histopathologic examination.



**Figure 3:** (A) Partially-pigmented erythematous plaque on the second hand finger; (B) Distinct glomerular vessels and patchy-dotted brown globules embedded in a structureless pigmented background.



**Figure 4:** (A) Peculiar glomerular vessels and dotted pigmentation distributed on a homogenous pigmented background; (B) Clustered brown globules with focal hypopigmentation.

## Results

Clinical, dermoscopic and histopathologic findings are summarized in Table 1-3. Regarding to the dermoscopic features, all lesions showed glomeruloid vessels distributed in clusters except one lesion (no 6). Scaling was seen in five lesions out of nine lesions (55.5%). Seven lesions (77.7%) revealed gray to brown globules and homogenous or structureless pigmentation were seen in five lesions (55.5%). Scaly

Case	Sex	Age	Site	Size (cm <sup>2</sup> )	Clinical description	Clinical diagnosis	Diagnosis
1	M	52	Trunk	3×2.5	Erythematous pigmented plaque	BD, BCC, Ecz, SCC	PBD
2	M	68	Leg	3×2	Erythematous plaque	BD, Ecz	NPBD
3	M	46	Hand	1×1	Erythematous pigmented plaque	BD	PBD
4	M	72	Trunk (4), Shoulder (2)	2.5×1.5 (mean)	Erythematous pigmented plaques	BCC, BD	PBD, Palmar punctate keratosis

**Note:** BD: Bowen disease; BCC: Basal cell carcinoma; Ecz: eczema; PBD: Pigmented Bowen disease; NPBD: Non pigmented Bowen disease.

**Table 1:** Clinical information of four Bowen's diseases.

No of lesion	Glomerular vessels	Brown globule	Structureless pigment	Pigmented streak	Pigment network	Hypopig-mentation	Scale	Ulcer
1 (case 1)	+	+	+	-	Global	Focal	+	-
2 (case2)*	+	-	-	-	-	-	+	-
3 (case 3)	+	+	+	+	-	Focal	-	-
4 (case 4)	+	+	+	-	-	Focal	-	-
5 (case 4)	+	+	-	-	-	-	+	-
6 (case 4)	-	+	+	+	-	-	-	-
7 (case 4)*	+	-	-	-	-	-	+	+
8 (case 4)	+	+	-	-	-	Focal	+	-
9 (case 4)	+	+	+	-	-	Focal	-	-
Total (%)	88.8	77.7	55.5	22.2	0	55.5	55.5	11.1

\*Nonpigmented Bowen disease.

**Table 2:** Dermoscopic findings of nine Bowen diseases in four cases.

Case	Scale (parakeratotic mounds)	Hyperkeratosis	Acanthosis	Pagetoid feature	Basal pigment-ation	Melanophage In dermis	Dilated engorged vessels	Inflamm- -ation	Fibrosis	Ulcer
1	+	+	Severe	-	++	++	+	+	-	+
2	+	+	Mild	+	-	-	+	+	+	-
3	+	+	Mode rate	-	+	+	+	+	+	-
4 (lesion 6)	+	+	Mild	-	+	+	-	+	-	-

**Table 3:** Histopathologic findings of Bowen disease.

surface was seen in five of nine lesions (55.5%). Focal hypopigmentation was seen in five lesions (55.5%) and one lesion was ulcerated. Pigmented streak was seen in only two lesions (22.2%) and brown globules were the second frequent finding following glomerular vessels.

In histopathologic evaluation, all cases revealed epidermal dysmaturation and keratinocytic atypia throughout the epidermis with numerous mitotic figures (Figure 1-4). All cases showed irregular psoriasiform acanthosis with elongation of rete ridges as well as convoluted ectatic blood vessels in the papillary dermis (Figure 1-4). Pigmentation of basal keratinocytes and melanophages in upper dermis are observed in cases 1, 3 and 4 (PBD). Case 2 is devoid of basal hyperpigmentation and melanophages in the reticular dermis (NPBD).

In dermoscopic-histopathologic correlation, all lesions showing glomerular vessels in dermoscopy except lesion 6, which histologically are corresponded with dilated and engorged blood vessels situating high in the papillary dermis (Cases 1-3, but not 4).

## Discussion

Bowen's disease is an intraepidermal squamous cell carcinoma referred to also as squamous cell carcinoma *in situ*. Lesions may also develop on non-sun-exposed skin such as the trunk and the vulva, and rarely on the lip, nipple, palm, sole, nail bed and the margin of an eyelid [6]. On the sun-exposed sites, the term bowenoid actinic (solar) keratosis is commonly used. Clinically, they are nonpigmented plaques but rarely could be pigmented. The clinical appearance of classical nonpigmented BD is represented by a slowly growing, erythematous, well-demarcated plaque with a scaly or crusty surface that may be eroded or ulcerated. The clinical differential diagnosis includes a variety of nonpigmented skin tumors or erythematous-squamous skin disorders, such as amelanotic melanoma, actinic keratosis, basal cell carcinoma, clear cell acanthoma, psoriasis, warts and eczema [7]. In contrast, pigmented BD is rare, and presents clinically as a nonuniformly pigmented plaque with a scaly or verrucous surface that should be differentiated from seborrheic keratosis, pigmented actinic keratosis, solar lentigo, basal cell carcinoma, blue nevus, melanocytic nevi and melanoma [8-10].

Dermoscopic-histopathologic correlation revealed glomerular vessels are precisely corresponded with engorged blood vessels identified in histologic evaluation. This is a common feature both in dermoscopy and histopathology of BD. Psoriasiform hyperplasia leading to high situation of papillary dermis containing convoluted and frequently dilated blood vessels. Glomerular vessels manifested dermoscopically, are completely correlated with this convoluted engorged/ectatic blood vessels arranged in papillary dermis. Additionally, each papulosquamous lesion with psoriasiform hyperplasia such as psoriasis, wart and clear cell acanthoma may dermoscopically show dotted or peculiar glomerular vessels [11,12].

Zalaudek et al. [11] reported that glomerular vessels presented in BD versus pinpoint/dotted/hairpin vessels that seen in malignant

skin neoplasms, such as squamous cell carcinoma and amelanotic melanoma are usually larger in size, often looped and regularly arranged in the clusters. They represent these glomerular vessels in 100% of nonpigmented BD and in 80% of pigmented BD. Like their report, glomerular vessels and brown globules are the most frequent features in our cases (90% vs. 88.8%). Bugatti et al. [12] noted that vascular pattern (dotted or 'glomerular' subtype) and scaly surface represent clues to the diagnosis of BD. In addition, a scaly surface was observed in more than 55% of our cases and in approximately 90% and 64.2% of the cases reported by Zalaudek and Bugatti, respectively. As the majority of our cases exhibited various amounts of pigmented gray to brown globules, the differential diagnosis of melanocytic lesions should be considered. The microscopic slide may not be completely representative of the dermoscopic features, therefore, serial sections could be ordered. In some cases, re-examination of the gross pathology specimen by melting the paraffin blocks might be also required [13].

In conclusion, dermoscopy as a noninvasive technique is used to improve the diagnostic performance of clinicians. Dermoscopy may be considered as a helpful tool for increasing the diagnostic accuracy of BD. Glomerular vessels in association of brown globules were the most frequent combination of criteria in pigmented and nonpigmented BD. Bowen's disease should be considered in the differential diagnosis with seborrheic keratosis, basal cell carcinoma and featureless melanoma. Further study is needed to assess the specificity and sensitivity of these dermoscopic criteria in differentiating BD from other pigmented and nonpigmented skin tumors as well as from inflammatory skin disorders.

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