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ORIGINAL ARTICLE

Atypical dermoscopic findings in patients diagnosed with lichen planus by histological examination

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ABSTRACT

Background/Objectives: Lichen planus (LP) is an inflammatory skin disorder characterized by discrete, violaceous, polygonal papules. The dermoscopic features of common inflammatory dermatoses are not well studied. Although previous studies have demonstrated the typical patterns of LP, we found some atypical dermoscopic findings without Wickham striae in patients who had been diagnosed with LP by histopathologic examination. Our aim was to assess the atypical dermoscopic patterns associated with LP.
Methods: We analyzed the dermoscopic features of seven LP lesions with atypical dermoscopic findings from seven patients who had been clinically and histopathologically diagnosed with LP.
Results: Dermoscopically, five of the seven patients showed the pigmented pattern. We observed the following diverse pigment patterns: dots/globules, diffuse peppering, perifollicular, and linear. We also observed vascular and erosive patterns of variant LP.
Conclusion: In this study, we emphasize the role of dermoscopy for identification of the clinical status of LP and its correlation to the results of histopathologic examinations. In addition to the typical dermoscopic patterns, dermoscopic recognition of variation in the morphology of LP could aid in the diagnosis of LP prior to histopathologic evaluation.

Introduction

Dermoscopy is a noninvasive diagnostic method that has been widely recognized as a useful method for assessing and monitoring patients with pigmented and nonpigmented skin tumors.[1–4] Dermoscopy is beneficial for the evaluation of vascular and pigmented structures that are not visible clinically,[1] and has also been reported to be a useful tool for the early recognition of malignant melanoma.[5] In recent years, its applicability has also been extended to the field of inflammatory skin disorders.[6] However, the dermoscopic features of common inflammatory dermatoses are not well studied, and limited data about their features are currently available. Lichen planus (LP), an inflammatory skin disorder, is a well-characterized dermatological condition that affects the skin, mucosa, hair, and nails, and is characterized by discrete, violaceous, polygonal papules.[7,8] The surface of LP lesions may exhibit white lines in a variable configuration, also known as Wickham striae (WS).[9] A nonvascular feature (whitish striae) is the most significant and typical dermoscopic finding in LP. The dermoscopic features of LP also include gray-blue dots, comedo, milium-like cysts, and vascular structures (red lines).[10] Although previous studies have demonstrated typical patterns of LP, we have observed atypical dermoscopic findings without WS in patients who had been diagnosed with LP by histopathologic examination and evaluated the correlation between dermoscopic patterns and histopathologic findings.

Materials and methods

Patients

We analyzed the dermoscopic findings of 108 LP lesions from 83 patients who had been clinically and histopathologically diagnosed with LP and were attending our hospital from March 2008 through

Conflicts of interest: The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in this article.

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February 2015. From the aforementioned patients who had received a confirmed diagnosis of LP, we selected seven patients who had some atypical dermoscopic findings.

Methods

Dermoscopy
All lesions were studied using a handheld dermoscope. Dermoscopic images were taken using a DermLite dermoscopy (Foto, 3Gen, LLC, Dana Point, California, USA), and all lesions were photographed using a Canon Powershot camera (Canon, Tokyo, Japan). Almost all images were obtained using contact dermoscopy with ultrasound gel for immersion.

Evaluation of dermoscopic images
Using computer-saved dermoscopic images, dermoscopic evaluation was performed by two independent dermatologists, who were unaware of the histopathologic findings. Pigmented patterns, vascular patterns, and background color were described according to the depiction of Güngör et al.[8]

Correlation between dermoscopic findings and histopathologic findings
Similar to the dermoscopic assessment, histopathologic evaluation was performed by two independent dermatologists, who were blinded to the dermoscopic findings.

Ethics statement

Written informed consent was obtained from all participants. The procedures were in accordance with the Helsinki Declaration of 1975, as revised in 1983.

Results

Clinical features of patients

Among the 108 LP lesions, seven atypical cases were selected, representing a rate of 6.48%. Seven patients with LP were selected for the study: two men and five women. The clinical characteristics of these patients are summarized in Table 1, and some of them are presented in Figures 1–4. The mean age of LP patients was 53.1 years (range, 31–67 years), and the mean duration of LP was 11.42 months. Of the seven patients, Patients 2 and 3 had acute generalized lichen planus (AGLP), Patient 5 had LP pigmentosus inversus, and Patients 4 and 6 had zosteriform LP pigmentosus.

Analysis of histopathologic features

The histopathologic features of seven patients are summarized in Table 1, and some of them are presented in Figures 1–4. Although the histologic findings differed among the patients, they could all be diagnosed as having LP because of several common findings. All patients had hyperkeratosis, melanin incontinence in the upper dermis, and a lymphohistiocytic bandlike infiltration in the papillary dermis. Liquefaction degeneration of the basal layer was noted in four patients (Patients 1, 2, 3, and 7). The histopathologic results for Patients 5 and 6 showed atrophic pigmented LP (Figure 3). These same patients also had LP in regression phase, whereas the other five had LP in active phase. We were also able to detect the dynamic course of the lesions in Patient 7 (Figure 4).

Analysis of dermoscopic features

All dermoscopic photographs were obtained during the first visit, prior to the histopathologic study. The dermoscopic features of all patients are summarized in Table 2, and some of them are presented in Figures 1–4. First, the pigmented structures were classified into the following patterns: dots/globules, peppering, perifollicular/annular, linear, reticular, cobblestone, and homogen cloud-like. Vascular structures were classified into red globules, red lines, and red dots. Among the seven patients, we observed no cases of WS, a well-known clinical characteristic of LP, but pigmented patterns were seen in all cases of LP, except for that of Patient 7. Among the seven LP patients, vascular patterns were observed in two patients (Patients 1 and 7). We also dermoscopically detected the dynamic course of the disease in Patient 7 (Figure 4). Histopathological findings showed that Patient 7 had neither a pigmented dermoscopic pattern nor melanin incontinence in the upper dermis (Table 1). We showed that pigmented patterns on dermoscopic examination corresponded with melanin incontinence and dermal melanophages.

Discussion

LP is a relatively common chronic inflammatory disease of the skin, mucous membranes, and hair follicles.[11] The clinical characteristics of LP include lesions with fine white-grayish crossing lines and streaks, referred to as WS. Hyperparakeratinization and hyperorthokeratinization are common findings and may clinically coincide with WS.[12]

The performance of dermoscopy has been investigated by many authors. According to evidence-based studies and meta-analysis, its use increases the diagnostic accuracy between 5% and 30% over clinical visual inspection.[13–16] Dermoscopy is widely used in the diagnosis of pigmented and nonpigmented skin tumors.[3,4] However, unlike other skin tumors, there are limited data about the dermoscopic pattern of inflammatory skin disorders, such as LP, plaque psoriasis, pityriasis rosea, and dermatitis. Although the dermoscopic features of common inflammatory dermatoses have not been well studied, several studies have characterized the typical dermoscopic features of LP.[3,8,10,17] In one of those studies,

Table 1 Summary of clinical and histologic data for patients with LP.

No.	Age/sex	Duration	Location	Morphology of lesions	Histologic findings[a]
1	71/M	3 mo	Right lower leg	Irregularly shaped purplish to brown colored patches	A, B, C, D, E, F
2	67/F	3 mo	Chest	Diffuse scattered brownish and dark pigmented macules and patches	A, B, D, E, F
3	56/F	5 mo	Trunk	Scattered brown macules	A, B, D, E, F
4	50/F	3 mo	Left popliteal area	Solitary brownish patch	A, B, C, D, E, F
5	40/F	2 y	Right abdomen	Linearly arranged brownish bandlike macules	A, C, D (focal), E, F (mild)
6	31/F	6 mo	Right neck	Localized linearly arranged brownish macules and patches	A, B, D (focal), E, F
7	46/M	3 y	Right shin	Localized relatively erythematous to brownish plaques on the lower legs with scattered depigmented patches	A, C, D, E, F

F = female; LP = lichen planus; M = male.
[a] A = hyperkeratosis; B = hypergranulosis; C = irregular acanthosis; D = liquefaction degeneration of the basal layer; E = melanin incontinence in upper dermis; F = bandlike dermal lymphohistiocytic infiltration.

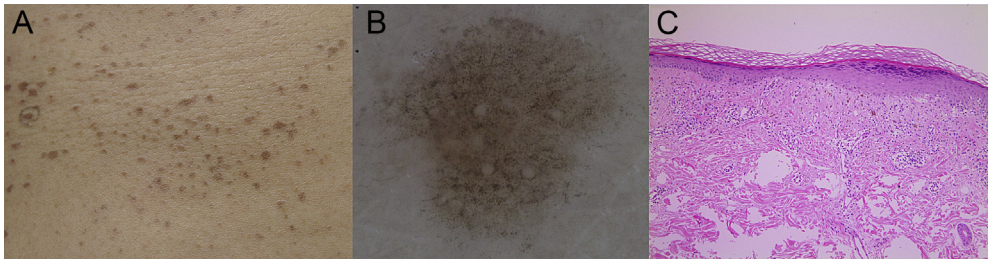

Figure 1 Patient 3. (A) Scattered brown macules on the trunk. (B) Annular granular structures with multiple brown to blue-gray dots surrounding the follicular ostia, and several brown globules. (C) Hyperkeratosis, hypergranulosis, liquefaction degeneration of the basal layer, melanin incontinence in upper dermis (hematoxylin and eosin, ×100).

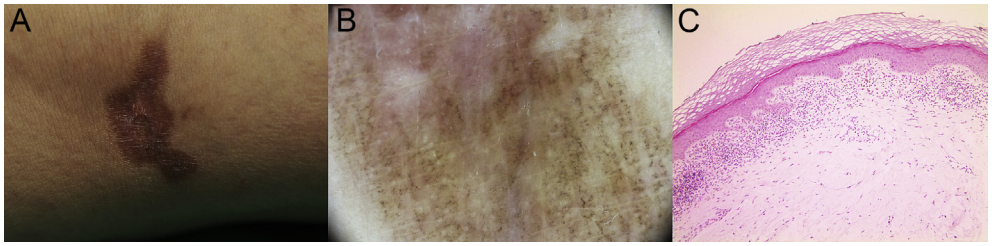

Figure 2 Patient 4. (A) Solitary brownish patch on the left popliteal area. (B) Multiple peppering brown dots, cobblestone pigmentation and linear pigmentation with white dots on the mild pink background, reticular pigmentation sparing epidermal furrows. (C) Hyperkeratosis, chronic lichenoid dermatitis with scattered melanophages in superficial dermis (hematoxylin and eosin, ×100).

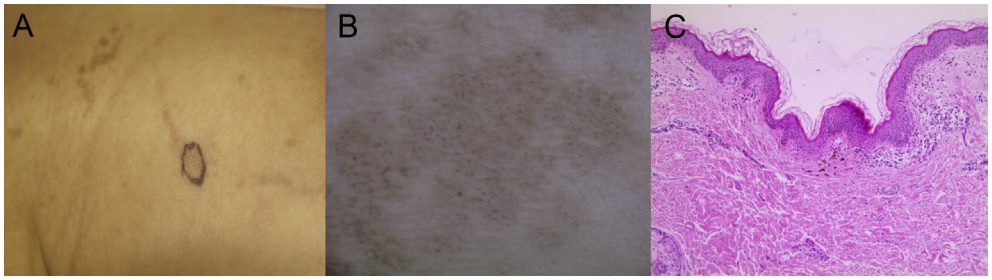

Figure 3 Patient 6. (A) Localized, linearly arranged brownish macules and patches on the right neck. (B) Multiple peppering brown dots with some white annular structure. (C) Hyperkeratosis, superficial dermal melanin pigmentation, interface dermatitis c melanophages, and perivascular and periappendigeal lymphocytic infiltration (hematoxylin and eosin, ×100).

WS were the most constant finding associated with LP (92%; $p < 0.001$).[10] In another study that compared dermoscopic features of psoriasis, dermatitis, LP, and pityriasis rosea, the white-grayish crossing lines of WS were exclusively detected in LP (96%; $p < 0.001$).[3] In dermoscopy, findings of WS correspond with compact orthokeratosis above the zones of wedge-shaped hypergranulosis (centered around acrosyringia and acrotrichia) histopathologically.[17] Peripheral linear capillaries perpendicularly surrounding the border of a lesion (radial capillaries) are usually intermingled with the WS border projections.[17]

These studies have identified dermoscopy to be a low-cost and noninvasive tool with clear use for enhancing the demonstration of WS in LP. Despite previous studies that demonstrated the typical patterns of LP, we found that some patients have atypical dermoscopic findings without WS. In our study, the most common atypical dermoscopic finding associated with LP is the hyperpigmented pattern.

WS has been observed to disappear after treatment, suggesting that dermatologists can use it as an activation marker in LP lesions.[8] Conversely, vascular patterns have been shown to occur at a higher rate in AGLP, which may be attributable to the rapid onset of the lesions. However, in our study, the patients who were classified as having AGLP (Patients 2 and 3) had no vascular patterns, dermoscopically. The histologic correlate of WS seems to be a compact orthokeratosis above the zones of wedge-shaped hypergranulosis. Conversely, in the pigmented type of LP the epidermis is thinner than other types of LP, and there are less granular wedge-shaped structures. For this histopathological reason, it is difficult to detect WS in the pigmented type of LP. The WS is less likely to correspond to the regression and activation phases of the disease. Finally, we must take into account that the clinical profitability of dermoscopy of inflammatory dermatoses must include not only a diagnostic purpose but also other fundamental aspects of daily practice, such as the improvement of morphological knowledge.

Vázquez-López et al[18] introduced several hyperpigmented forms of LP. In their study, the hyperpigmented lesions of 10 patients, which were biopsy-proven LP, were estimated by three distinct patterns: (1) diffuse (lesions showing diffuse, structureless, brownish areas); (2) dotted (lesions demonstrating fine or coarse gray-blue or brown dots or globules); and (3) mixed (diffuse brownish areas with dotted structures). According to the findings of that study, if the lesion has more diffuse hyperpigmented patterns, the lesion may resolve more quickly. According to this pilot study, dermoscopy may be useful for determining the prognosis of LP patients.

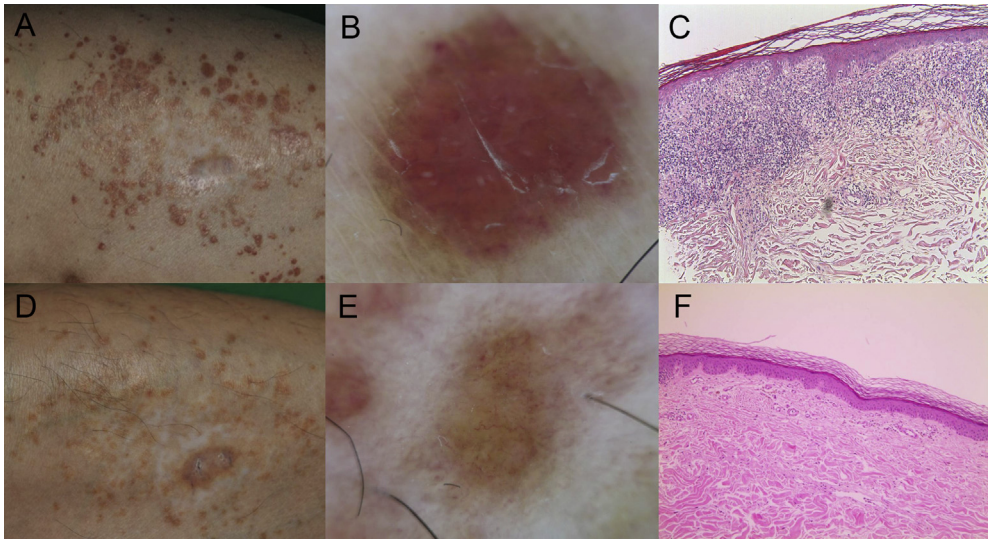

Figure 4 (A–C) Patient 7, prior to treatment. (D–F) Patient 7, after 4 months of treatment. (A) Localized relatively erythematous to brownish plaques on the lower legs with scattered depigmented patches on the shin. (B) Irregularly shaped vessels with telangiectasia on yellowish to erythematous background. (C) Hyperkeratosis, lymphocytic infiltration in the superficial dermis, some melanophages in the upper dermis, focal vacuolar alteration in the basal layer, and many dilated vessels on the upper dermis (hematoxylin and eosin, ×100). (D) Localized relatively erythematous to brownish plaques on the lower legs with scattered depigmented patches on the shin. (E) Irregularly shaped vessels with telangiectasia on yellow to brown colored background. (F) Hyperkeratosis, lymphocytic infiltration in the superficial dermis, some melanophages in the upper dermis, focal vacuolar alteration in the basal layer, and many dilated vessels on the upper dermis (hematoxylin and eosin, ×100).

Table 2 Summary of dermoscopic patterns for patients with LP.

Patient no.		1	2	3	4	5	6	7
Type of LP		CLP	AGLP	AGLP	LPP	LPPI	LPP	CLP
WS		−	−	−	−	−	−	−
Vascular pattern	Red globules	+	−	−	−	−	−	−
	Red lines	−	−	−	−	−	−	+
	Red dots	−	−	−	−	−	−	+
Pigmented pattern	Dots/globules	−	−	+	−	+	+	−
	Peppering	−	+	−	−	−	+	−
	Perifollicular/annular/granular	+	+	+	+	+	+	−
	Linear	−	−	+	−	+	−	−
	Reticular	−	−	−	−	−	−	−
	Cobble stone	−	−	+	−	+	−	−
	Homogen cloud like	−	−	−	+	−	−	−

AGLP = acute generalized lichen planus; CLP = classical lichen planus; LPP = lichen planus pigmentosus; LPPI = lichen planus pigmentosus inversus; WS = Wickham striae.

In a recent study, among 170 classical LP lesions from 60 patients, WS were observed in 152 lesions (89.4%).[8] In addition, different WS, pigment, and vascular patterns were also seen and were collectively referred to as an "LP variant." In that study, pigment patterns corresponded to dermal melanophages and pigment incontinence. The authors commented that the variable dermoscopic patterns show the dynamic course of the LP disease. Interestingly, they also assumed that WS can be used as an activation marker in LP lesions because WS disappeared after treatment in some cases. However, in our study only two patients were in a regression phase, and the remaining five patients were in an active phase of the disease. Even in the active phase, WS patterns were not observed. However, in other studies, in the early phase of the disease a peppering pigment pattern is seen that progresses to a reticular pattern over time.[8] Conversely, in our study the two patients (Patients 5 and 6) who showed an LP in the regression phase did not have a reticular pattern. We can assume that the patterns of pigmentation do not correspond to the activation status of the disease. Few studies have reported variant dermoscopic findings of LP. This study was intended to emphasize the role of dermoscopy, which can help to identify the clinical status of LP and its correlation to the results of histopathologic examinations.

Our study has several limitations. First, our study included a small number of patients. Second, because the lesions were only photographed when they were received at biopsy, we are unable to evaluate the treatment outcome of the patients. Furthermore, we do not have any information about long-term follow-up among these patients. There is limited information available on the correlations between dermoscopic and histopathologic patterns of LP. In one recent study, many lesions were dermoscopically analyzed if the patient had numerous lesions; thus, not all lesions were biopsied.[8] Because these studies did not perform biopsy for all lesions, there is a lack of materials that can prove the correlation between histopathologic patterns and dermoscopic patterns. In our study, biopsy was performed for all patients, and all biopsy sites were subject to dermoscopic evaluation.

In conclusion, we show atypical dermoscopic findings of LP lesions. We postulate that dermoscopic evaluation can be beneficial for both the diagnosis and evaluation of LP treatment and its outcomes. Further studies are warranted to explain why variable atypical dermoscopic findings can be detected in LP in order to evaluate the value in differentiating such findings from those of other cutaneous dermatoses disorders, such as benign lichenoid keratosis and solar lentigo. In our cases, the dermoscopic finding of

pigmented LP was difficult to differentiate from that of LP-like keratosis. Although dermoscopy and the naked eye fail to identify some clinically atypical LP lesions that exhibit no WS, histopathology helps to correctly identify atypical LP. This finding can assist physicians in reaching the correct diagnosis. Physicians should pay close attention to the differential diagnosis of such lesions. Identification of the morphology of atypical LP by dermoscope could aid in the diagnosis of LP prior to the histopathologic study.

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