Dermoscopic features of morphea and extragenital lichen sclerosus in Chinese patients

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Morphea and extragenital lichen sclerosus (ELS) are chronic inflammatory dermatoses that can be clinically similar. Morphea is typically characterized by successive development of erythematous patches, central hypopigmented sclerosis, and atrophic plaques. ELS manifests as blue-whitish papules, coalescing or enlarging into shiny, sclerotic, scar-like plaques. The differentiation between morphea and ELS can be difficult, especially in an early stage or in atypical cases. Moreover, coexistence of these two conditions can be observed, and biopsy is often necessary to distinguish them. Dermoscopy, as a non-invasive technology, is effective in assisting the diagnosis of cutaneous tumors and non-neoplastic dermatoses. Studies reporting the use of dermoscopy for the diagnosis of morphea and ELS in Caucasian patients have been published in succession.³⁴ We designed this prospective study to analyze and compare the dermoscopic features of morphea and ELS in Chinese patients.

This study was approved by the Ethics Committee of Peking Union Medical College Hospital (No. JS-2003), and all the participants provided written informed consent. Patients with histopathologically confirmed morphea and ELS, who presented at the Department of Dermatology, Peking Union Medical College Hospital, from January 2018 to August 2019, were prospectively included. All the patients underwent physical examination, dermoscopic evaluation, and skin biopsy at the same time. Patients who received any topical or systemic treatment within 1 month before the consultation were excluded.

Dermoscopic images were captured using a digital dermoscopy system (MoleMax HD, Digital Image Systems, Vienna, Austria) in polarized mode. Since multiple images were captured, which revealed different parts of each lesion, two separate dermoscopic analyses, one per-image (each photograph as a unit for analysis) and one per-patient (each patient as a unit for analysis), were independently performed by two experienced dermatologists who were blinded to the histopathologic results. We performed both analyses because in inflammatory dermatoses, different lesions, and different parts of each lesion could manifest different dermoscopic features. The combination of these two analyses could better reveal the dermoscopic features and the incidences of each feature to the maximum extent. Dermoscopic variables (considered as present or absent) were selected based on the previous literature and our preliminary observation.¹²³⁴ Statistical calculations were performed using SPSS 25.0 (IBM SPSS, Armonk, NY, USA), and the statistical significance was analyzed using the Pearson Chi-squared test, followed by a correction or Fisher exact test, depending on the conditions. A P value of less than 0.05 was considered statistically significant.

Ultimately, 131 dermoscopic images from 25 patients with morphea (7 men and 18 women; mean age: 30.4 years) and 54 dermoscopic images from 11 patients with ELS (one man and ten women; mean age: 37.0 years) were analyzed. The results are summarized in the Supplementary Table 1, http://links.lww.com/CM9/A262.

The results showed that the most common dermoscopic features of morphea included white clouds, as well as red structureless areas, linear curved vessels, and pigment networks, whereas ELS was characterized by white structureless areas, follicular plugs, as well as by scales, purple dots, shiny white streaks, peppering, and rainbow patterns [Figure 1A–H].

Of note, differences in all three sclerotic features were statistically significant, including white clouds (P < 0.001), white structureless areas (P < 0.001) and shiny white...
streaks ($P < 0.001$), according to per-image analysis. In particular, white clouds only appeared in the cases with morphea, whereas white structureless areas were only observed in the cases with ELS, and shiny white streaks were more common in the patients with ELS. These findings were in line with previous data. White clouds, which were previously described as “fibrotic beams” and were correlated with increased and thickened collagen bundles in the reticular dermis, were the hallmark of morphea, whereas white structureless areas, due to diffuse and dense superficial dermal collagen homogenization, were commonly and specifically found in patients with ELS. These two features can be morphologically similar, but since the pathologic changes in morphea are deeper, white clouds are relatively smaller in size and more opaque in color, with ill-defined margins. Meanwhile, shiny white streaks could be observed in both dermatoses but more frequently in ELS, which is histopathologically related to an increased dermal collagen density.

Regarding other features, we found that the patients with ELS also showed more scales, rainbow patterns, follicular plugs, and purple dots ($P = 0.005$, $P = 0.005$, $P < 0.001$, and $P = 0.002$, respectively). The possible reason for more prominent purple dots is that patients with ELS may suffer from more severe itch than patients with morphea, leading to more obvious scratching and bleeding. Furthermore, inflammatory features, including red structureless areas and various vascular structures, were quite prevalent in both dermatoses. However, only linear curved vessels showed a statistically significant difference ($P < 0.001$) between morphea (48.1%) and ELS (81.5%), based on the per-image evaluation. This finding is consistent with the data of a previous study; however, the frequency was somewhat higher in our study. The fact that most of the included patients were at their inflammatory phase might explain this difference. Considering pigmentary structures, we first described pigmentation along with skin grooves and perifollicular pigmentation, as two features in both

![Figure 1](image-url)

Figure 1: (A) A patient with morphea presented with a red-brown and sclerotic macule on the left breast. (B) Histopathologic examination revealed hyperkeratosis, epidermal atrophy, and hyperpigmentation in the stratum basale, with a homogenous dermis and thickened collagen bundles. Appendages were absent (hematoxylin-eosin staining, original magnification × 200). (C) Dermoscopy showed multiple white clouds, along with a pigment network (polarized mode, original magnification × 40). (D) Linear curved vessels were also prominent (polarized mode, original magnification × 40). (E) A patient with ELS presented with multiple shiny, white sclerotic papules on the left arm. (F) Histopathologic examination revealed hyperkeratosis and epidermal atrophy in the epidermis. The superficial dermis was homogenous. A follicular plug was observed (hematoxylin-eosin staining, original magnification × 200). (G) Dermoscopy showed white structureless areas, multiple shiny white streaks, and follicular plugs (polarized mode, original magnification × 40). (H) Peppering, a rainbow pattern, and many purple dots were also revealed (polarized mode, original magnification × 40). (I) A pigmented, sclerotic plaque with an atrophic surface on the trunk of a patient with ELS. (J) Dermoscopy showed pigmentation along with skin grooves, and pigmentation goes along the skin furrows (polarized mode, original magnification × 40). (K) A pigmented, sclerotic, and slightly atrophic plaque on the back of a patient with morphea. (L) Dermoscopy showed perifollicular pigmentation distributed around follicular openings (polarized mode, original magnification × 40). ELS: Extragenital lichen sclerosus.
dermatoses [Figure 1I–L]. Moreover, peppering and pigmentation along with skin grooves were more common in ELS, with statistically significant differences ($P < 0.001$ and $P = 0.036$, respectively) in the per-image analysis.

In conclusion, dermoscopic features of morphea and ELS lesions in Chinese patients were overall in line with the data of previous studies carried out in Caucasian patients; however, different frequencies and distributions could be observed. These dermoscopic differences can help differentiate the two conditions in clinical practice. For further study, enlarging the sample size and analyzing dermoscopic features according to the age, sex, anatomical sites and disease phases are needed.

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**Conflicts of interest**

None.

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