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ORIGINAL RESEARCH

Chronic Cutaneous Lupus Erythematosus in a White Population: Dermoscopic Characteristics by Clinical Subtype, Lesion Location and Disease Duration

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ABSTRACT

Introduction: Chronic cutaneous lupus erythematosus (CCLE) comprises three major clinical variants: discoid lupus erythematosus (DLE), chilblain lupus erythematosus (CHLE), and lupus erythematosus profundus, also referred to as lupus erythematosus panniculitis (LEP). The aim of the current study was to systematically describe the dermoscopic features of CCLE in Polish patients with Fitzpatrick skin phototypes I–III.

Methods: The videodermoscopic images from patients with various clinical variants of CCLE (DLE, CHLE and LEP) were reviewed. Predefined parameters for dermoscopic evaluation in general dermatology were used to describe the findings in lesions located beyond the scalp. In the analysis of trichoscopic findings in lesions located on the scalp, dermoscopic features of follicular openings, hair shafts, the perifollicular surface, the interfollicular surface and vessel morphology were considered. Based on personal experience, several additional dermoscopic and trichoscopic characteristics were included in the analysis.

Results: A total of 85 lesions from 26 patients (16 women and 10 men; mean age 40.8 ± 11.2 years) were assessed. DLE on glabrous skin showed polymorphous vessels (89.1%), pink-red background (70.9%), follicular plugs (67.3%) and white scaling (58.2%), while scalp DLE was characterized by polymorphous vessels (83.3%), yellow dots (66.7%), follicular plugs (55.6%) and a reduced number of follicles (55.6%). Labial DLE (n = 2) showed linear branched and linear curved vessels, white structureless areas, red structureless (hemorrhagic) areas and red dots/globules. White scaling (61.1% vs. 34.1%; p = 0.042), gray-brown dots/globules (44.4% vs. 12.2%; p = 0.015) and peripheral pigmentation (100.0% vs. 46.2%; p = 0.036) were significantly more common in long-lasting (> 1 year) DLE lesions. CHLE (n = 5) presented with polymorphous vessels, white scales, pink-red background, red structureless areas and red dots/globules. LEP showed polymorphous vessels, white-yellow scales, follicular plugs, white structureless areas and red hemorrhagic areas.

Conclusions: Dermoscopy might be useful in the preliminary diagnosis of DLE, and its role in the diagnosis of CHLE and LEP needs further elucidation.

Keywords: Dermoscopy; Videodermoscopy; DLE; Discoid lupus erythematosus; Cutaneous lupus erythematosus; Lupus panniculitis; Chilblain lupus; Lupus profundus

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Key Summary Points

Lupus erythematosus-specific cutaneous lesions are characterized by a wide variety of clinical presentations. Dermoscopic features of DLE have been the subject of several studies, but most of those reports focused on trichoscopic features of the scalp DLE and were carried out in dark-skinned individuals.

The aim of the study was to systematically describe the dermoscopic features of CCLE (DLE, CHLE and LEP) in white patients, with emphasis on lesion location and duration.

DLE was characterized by a wide variety of dermoscopic findings. White scaling, gray-brown dots/globules and peripheral pigmentation were more commonly observed in long-lasting (> 1 year) DLE lesions. In addition, we present novel dermoscopic findings in CHLE and LEP.

Dermoscopy might be useful in the preliminary diagnosis of DLE and assessment of lesion duration; however, its role in the diagnosis of CHLE and LEP needs further elucidation.

INTRODUCTION

Skin involvement in lupus erythematosus (LE) is characterized by a wide variety of clinical presentations and is divided into LE-specific and LE-nonspecific manifestations [1, 2]. LE-specific lesions encompass various clinical variants of cutaneous lupus erythematosus (CLE). In the Duesseldorf Classification, four subtypes of CLE are recognized: acute CLE (ACLE), subacute CLE (SCLE), chronic CLE (CCLE) and intermittent CLE (ICLE) [1, 3]. CCLE, in turn, comprises three major clinical variants: discoid LE (DLE), chilblain LE (CHLE), and LE profundus (LEP), also referred to as LE panniculitis [1–3].

DLE is the most common subtype of CCLE. Clinically, DLE presents with well-demarcated erythematous plaques with adherent keratotic plugs, which give a characteristic "carpet tack" sign after removal. Long-lasting lesions typically show scarring, hyperpigmentation and teleangiectasia, and may lead to permanent alopecia when present on the scalp [2]. In 80% of cases, the lesions are located on sun-exposed areas above the neck (face, ears, scalp). The disseminated variant of DLE (DDLE) comprises 20% of cases, with discoid lesions located both above and below the neck [4].

CHLE typically presents with violaceous plaques in acral locations, predominantly on fingers and toes [5]. Hyperkeratosis, as well as erosions and ulcerations, may be observed within the lesions. LEP is clinically characterized by indurated plaques leading to deep atrophy, while lobular panniculitis and mucin deposits between the collagen bundles are observed on histopathology [6]. Both CHLE and LEP may be associated with DLE, and they may develop in the context of systemic LE (SLE) [7].

So far, the (video)dermoscopic features of DLE have been the subject of several studies [8–22]. However, most of those reports focused on trichoscopic features of the scalp DLE [11, 14–19]. The number of studies evaluating the dermoscopic features of DLE in other locations beyond the scalp is limited [9, 10, 13, 20, 21]. There is also scarce data on the dermoscopic presentation of DLE involving lips or mucous membranes (mucoscopy) [10, 12]. In addition, most of the studies were carried out in dark-skinned individuals [10, 11, 13–19]. At the same time, to the best of our knowledge, there are no data in the English literature on the dermoscopic features of the other two subtypes of CCLE, namely CHLE and LEP.

The aim of the current study was to systematically describe the dermoscopic features of CCLE in white patients (Fitzpatrick skin phototypes I–III), with particular emphasis placed on the clinical variant, location and lesion duration.

METHODS

This observational study was conducted in the Department of Dermatology in Rzeszow, located in southeastern Poland. The project was approved by the Bioethics Committee of Rzeszow University (Decision No. 6/11/2020, dated 19 November 2020), and all study participants signed the informed consent form for the use of their medical records and photos for scientific purposes and the publication of the images.

The videodermoscopic images from patients with various clinical variants of CCLE (DLE, CHLE and LEP) diagnosed between 1 December 2020 and 30 November 2021 were reviewed. Only patients with a histopathologically confirmed diagnosis and untreated lesions of CCLE were included. Exclusion criteria were as follows: uncertain diagnosis, poor dermoscopic image quality and a lack of data on the location and/or duration of the lesion.

Dermoscopic assessments were performed using a Canfield D200^{EVO} Videodermatoscope at 20–70-fold magnification. In each patient, at least one image without immersion fluid ("dry dermoscopy") and one image with ultrasound gel ("wet dermoscopy") was available. Dry dermoscopy enabled better assessment of scaling, while the examination with the use of ultrasound gel and minimal pressure ensured proper visualization of vessels.

In each patient, clinical data including age, sex, comorbidities, the location of the plaques and lesion duration were collected. Predefined parameters for dermoscopic evaluation in general dermatology were used to describe the findings in CCLE lesions located beyond the scalp, including mucous membranes [22]. These criteria included morphology and distribution of vessels, color and distribution of scaling, follicular findings, presence of other structures (colors and morphologies) and specific clues. In the analysis of trichoscopic findings in lesions located on the scalp, dermoscopic features of follicular openings, hair shafts, the perifollicular surface, the interfollicular surface and vessel morphology were considered. Based on personal experience, several additional dermoscopic and trichoscopic characteristics were included in the analysis.

The videodermoscopic examination was performed by the same investigator (M.Z.) in all cases. Analysis of the dermoscopic findings was performed independently by two dermatologists (M.Z. and A.R.), and all discrepancies were discussed until a consensus was reached.

Statistical Analysis

Statistical analysis was performed using Statistica® 13.0 Software for Windows Software (Tibco, Kraków, Poland). Categorical data were expressed as absolute numbers and percentages. Continuous data were presented as mean ± standard deviation (SD) of the mean and median (range). Differences in the frequencies of dermoscopic features depending on the duration of the lesion were evaluated using the chi-square test. A p value < 0.05 was considered statistically significant.

RESULTS

A total of 26 patients (16 women and 10 men; mean age 40.8 ± 11.2 years) were included. All patients had Fitzpatrick skin phototypes I–III. DLE was diagnosed in 20 patients, CHLE in 5 participants, and LEP was present in a single case. The mean duration of DLE was 23.7 ± 35.4 months, with a median of 10 months. The duration of CHLE was 7 ± 4.1 months, and that of LEP was 12 months. Only one patient with DLE plaques had SLE. On the other hand, nearly all patients with the other two variants of CCLE (CHLE and LEP) had associated SLE. Demographic and clinical characteristics of the study participants are presented in Table 1.

Videodermoscopic images of a total of previously untreated 85 lesions, including 55 DLE lesions located on nonhairy skin and 22 DLE plaques on the scalp and eyebrows, were available for analysis. In two patients, involvement of the vermilion border and lips with DLE was present.

Table 1 Clinical characteristics of the study participants

Clinical characteristics	CCLE			
	Total ***n*** **= 26**	**DLE** ***n*** **= 20**	**CHLE** ***n*** **= 5**	**LEP** ***n*** **= 1**
Gender, *n* (%)				
Male	10 (38.5)	9 (45.0)	1 (20.0)	0 (0.0)
Female	16 (61.5)	11 (55.0)	4 (80.0)	1 (100.0)
Age, years				
Mean ± SD	40.8 ± 11.2	40.5 ± 12.3	40.8 ± 7.26	47.0
Median (range)	39.5 (15–62)	39.5 (15–62)	38 (34–53)	–
Fitzpatrick skin phototype, *n* (%)				
I	9 (34.6)	6 (30.0)	3 (60.0)	0 (0.0)
II	13 (50.0)	10 (50.0)	2 (40.0)	1 (100.0)
III	4 (15.4)	4 (20.0)	0 (0.0)	0 (0.0)
Location of lesions, *n* patients / *n* lesions				
Scalp	10/18	10/18	–	–
Eyebrows	4/4	4/4	–	–
Face	17/36	17/36	–	–
Ears	5/5	5/5	–	–
Lips	2/2	2/2	–	–
Chest	2/2	2/2	–	–
Breast	1/1	0/0	–	1/1
Back	3/5	3/5	–	–
Arms	2/3	2/3	–	–
Forearms	2/2	2/2	–	–
Hands	6/6	2/2	4/4	–
Palms	5/5	-	5/5	–
Duration of the lesions, months				
Mean ± SD	22.6 ± 34.4	23.7 ± 35.4	7 ± 4.1	12
Median (range)	10 (1–216)	10 (2–216)	7 (1–12)	–
SLE, *n* (%)	6 (23.1)	1 (5.0)	4 (80.0)	1 (100.0)

SD standard deviation, *SLE* systemic lupus erythematosus, *CCLE* chronic cutaneous lupus erythematosus, *DLE* discoid lupus erythematosus, *CHLE* chilblain lupus erythematosus, *LEP* lupus erythematosus profundus

Table 2 Dermoscopic findings in various clinical variants of chronic cutaneous lupus erythematosus (CCLE)

Dermoscopic characteristics	DLE					CHLE	LEP
	Total $n = 55$	Face $n = 36$	Ears $n = 5$	Trunk $n = 7$	Upper extremities $n = 7$	Hands $n = 5$	Breast $n = 1$
Morphology of vessels, *n* (%)							
Dotted	9 (16.4)	5 (13.9)	0 (0.0)	2 (28.6)	2 (28.6)	5 (100.0)	0 (0.0)
Linear	46 (83.6)	31 (86.1)	3 (60.0)	5 (71.4)	7 (100.0)	2 (40.0)	1 (100.0)
Linear with branches	34 (61.8)	21 (58.3)	4 (80.0)	7 (100.0)	2 (28.6)	1 (20.0)	1 (100.0)
Thick	13 (23.6)	12 (33.3)	1 (20.0)	0 (0.0)	0 (0.0)	1 (20.0)	1 (100.0)
Thin	33 (60.0)	20 (55.6)	4 (80.0)	7 (100.0)	2 (28.6)	1 (20.0)	1 (100.0)
Linear curved	48 (87.3)	31 (86.1)	5(100.0)	6 (85.7)	6 (85.7)	1 (20.0)	1 (100.0)
Polymorphous	49 (89.1)	33 (91.7)	4 (80.0)	6 (85.7)	6 (85.7)	3 (60.0)	1 (100.0)
Distribution of vessels, *n* (%)							
Uniform	5 (9.1)	3 (8.3)	0 (0.0)	2 (28.6)	0 (0.0)	0 (0.0)	0 (0.0)
Clustered	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Peripheral	13 (23.6)	4 (11.1)	1 (20.0)	3 (42.9)	5 (71.4)	0 (0.0)	0 (0.0)
Unspecific	38 (69.1)	29 (80.6)	4 (80.0)	2 (28.6)	3 (42.9)	5 (100.0)	1 (100.0)
Color of scales, *n* (%)							
White	32 (58.2)	20 (55.6)	3 (60.0)	5 (71.4)	5 (71.4)	4 (80.0)	1 (100.0)
Yellow	16 (29.1)	8 (22.2)	2 (40.0)	4 (57.1)	4 (57.1)	0 (0.0)	1 (100.0)
Gray	4 (7.3)	2 (5.6)	2 (40.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Distribution of scales, *n* (%)							
Diffuse	4 (7.3)	3 (8.3)	0 (0.0)	0 (0.0)	1 (14.3)	0 (0.0)	0 (0.0)
Central	9 (16.4)	6 (16.7)	0 (0.0)	0 (0.0)	3 (42.9)	0 (0.0)	0 (0.0)
Peripheral	6 (10.9)	2 (5.6)	0 (0.0)	3 (42.9)	1 (14.3)	1 (20.0)	0 (0.0)
Patchy	25 (45.5)	14 (38.9)	4 (80.0)	4 (57.1)	3 (42.9)	3 (60.0)	1 (100.0)
Follicular findings, *n* (%)							
Rosettes	18 (32.7)	16 (44.4)	2 (40.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Follicular plugs	37 (67.3)	26 (72.2)	4 (80.0)	3 (42.9)	4 (57.1)	1 (20.0)	1 (100.0)
Follicular red dots	8 (14.5)	8 (22.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Perifollicular white halo	21 (38.2)	18 (50.0)	3 (60.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Perifollicular pigmentation	4 (7.3)	2 (5.6)	0 (0.0)	2 (28.6)	0 (0.0)	0 (0.0)	0 (0.0)
Perifollicular scaling	8 (14.5)	5 (13.9)	1 (20.0)	0 (0.0)	2 (28.6)	0 (0.0)	0 (0.0)

Table 2 continued

Dermoscopic characteristics	DLE					CHLE	LEP
	Total $n = 55$	Face $n = 36$	Ears $n = 5$	Trunk $n = 7$	Upper extremities $n = 7$	Hands $n = 5$	Breast $n = 1$
Morphologies/colors, *n* (%)							
White structureless areas	17 (30.9)	10 (27.8)	1 (20.0)	2 (28.6)	4 (57.1)	1 (20.0)	1 (100.0)
Pink structureless areas	16 (29.1)	7 (19.4)	1 (20.0)	3 (42.9)	5 (71.4)	2 (40.0)	0 (0.0)
Yellow structureless areas	5 (9.1)	1 (2.8)	0 (0.0)	3 (42.9)	1 (14.3)	0 (0.0)	0 (0.0)
Dots/globules	26 (47.3)	16 (44.4)	2 (40.0)	4 (57.1)	4 (57.1)	3 (60.0)	1 (100.0)
Red globules	7 (12.7)	2 (5.6)	1 (20.0)	0 (0.0)	0 (0.0)	1 (20.0)	0 (0.0)
Grey-brown dots	16 (29.1)	11 (30.6)	1 (20.0)	3 (42.9)	1 (14.3)	0 (0.0)	0 (0.0)
Gray-brown globules	4 (7.3)	2 (5.6)	0 (0.0)	2 (28.6)	0 (0.0)	0 (0.0)	0 (0.0)
White-yellowish globules	3 (5.5)	3 (8.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
White lines	6 (10.9)	1 (2.8)	1 (20.0)	0 (0.0)	4 (57.1)	0 (0.0)	0 (0.0)
Circles	1 (1.8)	1 (2.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Specific clues, *n* (%)							
Peripheral pigmentation	16 (29.1)	12 (33.3)	2 (40.0)	2 (28.6)	0 (0.0)	0 (0.0)	0 (0.0)
Yellowish crust	11 (20.0)	3 (8.3)	2 (40.0)	3 (42.9)	3 (42.9)	0 (0.0)	0 (0.0)
Erosion	14 (25.5)	7 (19.4)	2 (40.0)	2 (28.6)	3 (42.9)	1 (20.0)	0 (0.0)
"Sticky fiber" sign	1 (1.8)	1 (2.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Pink-red background	39 (70.9)	29 (80.6)	3 (60.0)	3 (42.9)	4 (57.1)	5 (100.0)	1 (100.0)
Dilated follicles	16 (29.1)	15 (41.7)	0 (0.0)	1 (14.3)	0 (0.0)	0 (0.0)	1 (100.0)
Red hemorrhagic areas	21 (38.2)	12 (33.3)	3 (60.0)	2 (28.6)	4 (57.1)	4 (80.0)	1 (100.0)
Comedo-like openings	4 (7.3)	4 (11.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

DLE discoid lupus erythematosus, *CHLE* chilblain lupus erythematosus, *LEP* lupus erythematosus profundus, *n* number of lesions

Discoid Lupus Erythematosus (DLE)

Dermoscopy

Dermoscopic features of 55 DLE lesions were analyzed. The majority of the lesions were located on the face (65%). Table 2 summarizes the dermoscopic findings according to the location of the lesion. The predominant findings were polymorphous vessels (89.1%) with an unspecific distribution (69.1%), pink-red background (70.9%), follicular plugs (67.3%) and white scaling (58.2%). Linear curved (87.3%) and linear (83.6%) vessels were most frequently observed, followed by linear branched (61.8%) vessels. Dotted vessels (16.4%) were an uncommon finding. Other dermoscopic features included a perifollicular white halo (38.2%), red structureless (hemorrhagic) areas (38.2%), rosettes (32.7%), white structureless areas (30.9%), pink structureless areas (29.1%), peripheral pigmentation (29.1%), gray-brown dots (29.1%), dilated follicles (29.1%), erosions (25.5%), yellowish crusts (20.0%),

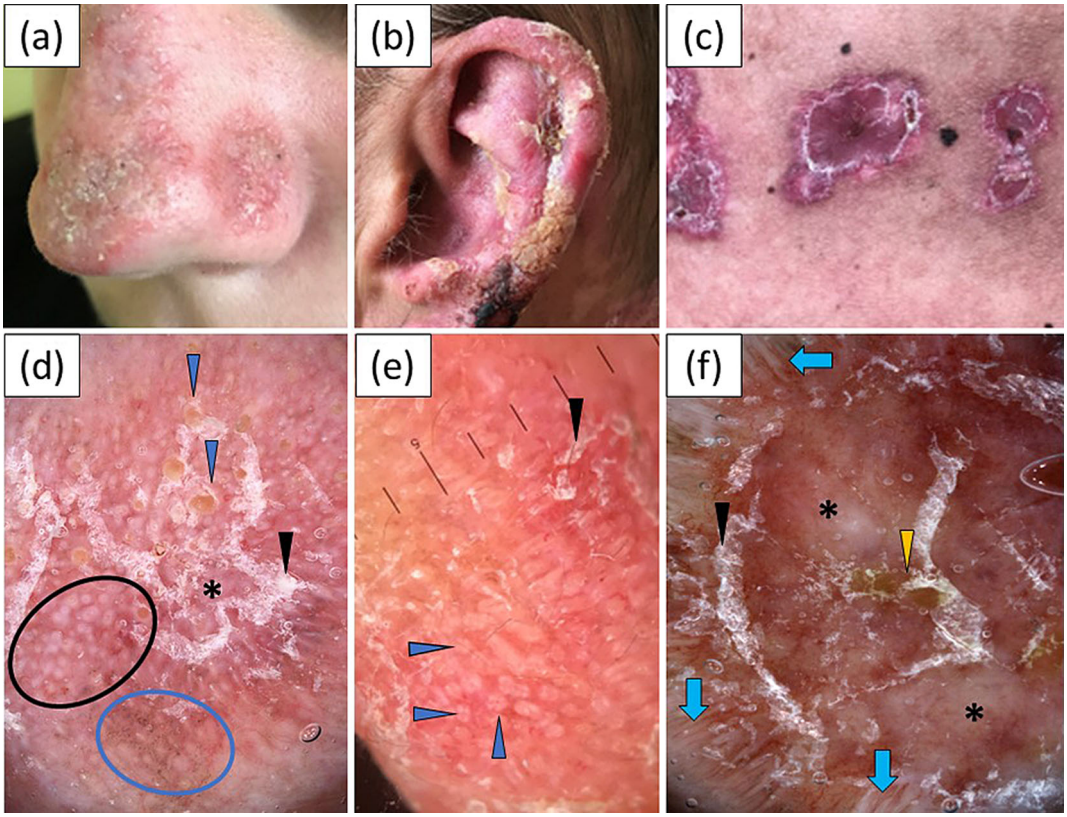

Fig. 1 Clinical presentation of discoid lupus erythematosus (DLE) plaques on the **a** nose, **b** ear and **c** back. **d–f** Corresponding videodermoscopic images. **d** Videodermoscopic findings in the lesion on the nose: white scales (*black arrowhead*), follicular plugs (*blue arrowheads*), white perifollicular halo (*black circle*), pinkish structureless areas (*black asterisk*) and peripheral gray-brown dots (*blue circle*). **e** Videodermoscopic features of the DLE involving the ear: white scaling (*black arrowhead*) and multiple rosettes (*blue arrowheads*). **f** Videodermoscopy of the DLE plaques on the back: peripheral white scaling (*black arrowhead*) and white-yellowish scales (*yellow arrowhead*) in the center of the plaque, white–pink structureless areas (*black asterisks*) and linear and linear curved (hairpin) vessels at the periphery (*blue arrows*)

follicular red dots (14.5%) and white shiny lines (10.9%). Sample dermoscopic images of lesions in different locations are presented in Fig. 1.

Trichoscopy

Trichoscopic features of a total of 22 DLE lesions, including 18 lesions located on the scalp and 4 plaques within the eyebrows, were analyzed (Table 3). Scalp DLE was characterized by the presence of polymorphous vessels (83.3%), yellow dots (66.7%), follicular plugs (55.6%), a reduced number of follicles (55.6%), hair diameter diversity (44.4%), absence of vellus hair (44.4%) and pink background (44.4%). Linear curved vessels were most commonly observed (77.8%), followed by linear (59.1%) and linear branched (59.1%) vessels. Dotted vessels were noted in only one case of scalp DLE (5.6%). Sample dermoscopic images are presented in Fig. 2.

Four DLE lesions were located within the eyebrows. In these cases, hair diameter diversity (100%) with presence of short vellus hair (75.0%) and linear vessels were the predominant findings. Keratotic plugs as well as red hemorrhagic areas and linear branched and linear curved vessels were observed in half of the cases. Details are summarized in Table 3.

Mucoscopy

Two patients presented with labial DLE. In both cases, linear branched and linear curved vessels

Table 3 Trichoscopic findings in discoid lupus erythematosus (DLE)

Trichoscopic characteristics	DLE		
	Total *n* = 22	Scalp *n* = 18	Eyebrows *n* = 4
Follicular findings, *n* (%)			
Rosettes	2 (18.2)	3 (16.7)	1 (25.0)
Follicular plugs	12 (54.5)	10 (55.6)	2 (50.0)
Absence of openings	7 (31.8)	7 (38.9)	0 (0.0)
Yellow dots	12 (54.5)	12 (66.7)	0 (0.0)
Black dots	2 (9.1)	2 (11.1)	0 (0.0)
Red follicular dots	1 (4.5)	1 (5.6)	0 (0.0)
Reduced number of follicles	10 (45.5)	10 (55.6)	0 (0.0)
Hair shafts, *n* (%)			
Short vellus hair	9 (40.9)	6 (33.3)	3 (75.0)
Hair diameter diversity	12 (54.5)	8 (44.4)	4 (100.0)
Circular hair	2 (9.1)	2 (11.1)	0 (0.0)
Absence of vellus hair	8 (36.4)	8 (44.4)	0 (0.0)
Perifollicular surface, *n* (%)			
Scaling	3 (13.6)	3 (16.7)	0 (0.0)
Erythema	4 (18.2)	4 (22.2)	0 (0.0)
Pigmentation	5 (22.7)	5 (27.8)	0 (0.0)
Tubular hair casts	2 (9.1)	2 (11.1)	0 (0.0)
White halo	3 (13.6)	2 (11.1)	1 (25.0)
Interfollicular surface, *n* (%)			
White structureless areas	2 (9.1)	1 (5.6)	1 (25.0)
Pink structureless areas	5 (22.7)	4 (22.2)	1 (25.0)
White scales	4 (18.2)	3 (16.7)	1 (25.0)
Yellow scales	3 (13.6)	3 (16.7)	0 (0.0)
Pink background	9 (40.9)	8 (44.4)	1 (25.0)
Honeycomb pigment pattern	7 (31.8)	7 (38.9)	0 (0.0)
Gray dots/globules	5 (22.7)	5 (27.8)	0 (0.0)
Red hemorrhagic areas	5 (22.7)	3 (16.7)	2 (50.0)
Erosions	1 (4.5)	1 (5.6)	0 (0.0)
Vessel morphology, *n* (%)			
Dotted	1 (4.5)	1 (5.6)	0 (0.0)
Linear	16 (72.7)	13 (59.1)	3 (75.0)
Linear branched	15 (68.2)	13 (59.1)	2 (50.0)
Thin	14 (63.6)	12 (66.7)	2 (50.0)
Thick	8 (36.4)	7 (38.9)	1 (25.0)
Linear curved	16 (72.7)	14 (77.8)	2 (50.0)
Polymorphous	17 (77.3)	15 (83.3)	2 (50.0)

n number of lesions

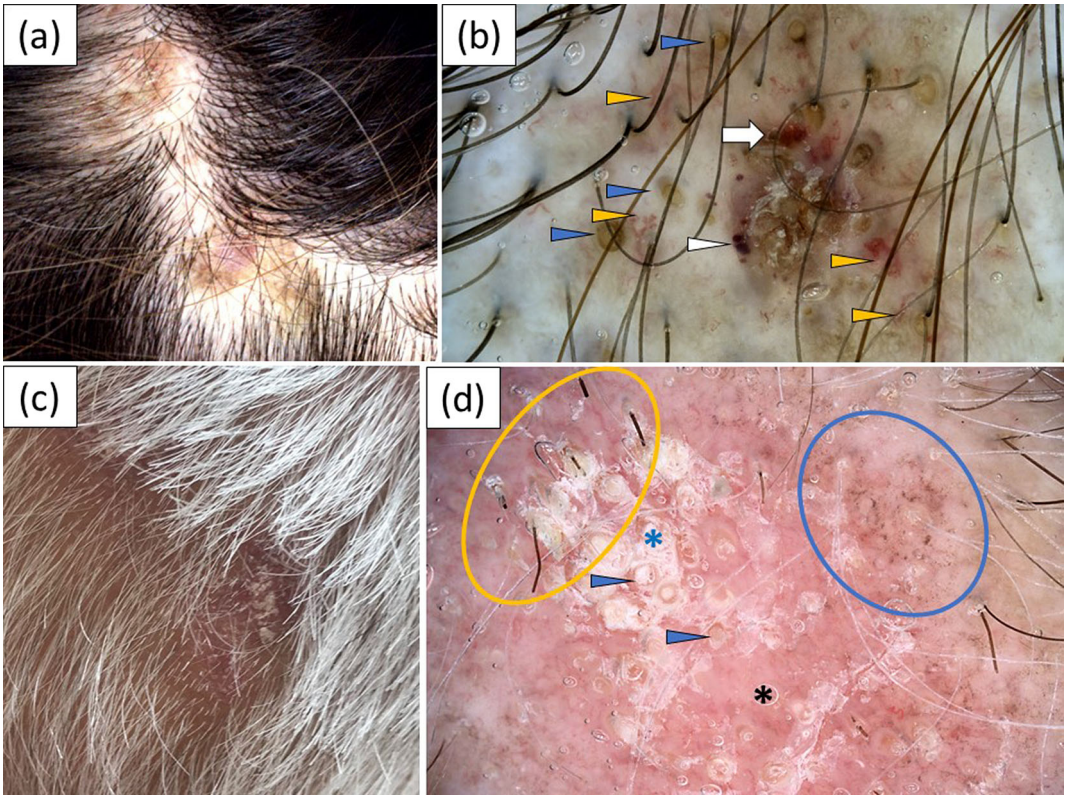

Fig. 2 **a**, **c** Clinical presentation of discoid lupus erythematosus (DLE) plaques on the scalp. **b**, **d** Corresponding videodermoscopic images. **b** Videodermoscopy showing yellow dots (*blue arrowheads*), linear, linear curved and linear branched vessels (*yellow arrowheads*), red hemorrhagic globules corresponding to dried blood (*white arrowhead*) and red structureless (lake-like) areas (*white arrow*). **d** Videodermoscopy showing extensive white scaling (*blue asterisk*) with follicular plugs (*blue arrowheads*), broken hair (*yellow circle*), pink structureless areas (*black asterisk*) and peripheral gray-brown dots (*blue circle*)

with an unspecific distribution were observed under dermoscopy. White structureless areas, red structureless (hemorrhagic) areas and red dots/globules were present in both patients. In addition, one patient showed the presence of dotted vessels, follicular plugs at the vermillion border and white scaling, while the other showed yellow scales, white lines and erosion under dermoscopy (Table 4, Fig. 3).

Dependence of Dermoscopic Characteristics on the Duration of the Lesion

DLE plaques were divided into two groups depending on the duration of the individual lesion. "Early lesions" were defined as those with durations of of up to 12 months, and "late lesions" were those with durations of more than 12 months. The frequencies of individual dermoscopic/trichoscopic characteristics were compared between the early and late DLE lesions, and separate analyses were performed for scalp/eyebrow DLE and DLE plaques located beyond the scalp. Results are summarized in Table 5.

In DLE plaques beyond the scalp, white scales (74.1% vs. 42.9%; $p = 0.047$) and gray dots/globules (63.0% vs. 10.7%; $p = 0.016$) were significantly more common in lesions of longer duration (more than 12 months). A similar trend was observed for peripheral pigmentation, but this did not reach statistical significance ($p = 0.056$). On the other hand, in scalp/eyebrow DLE, reduced number of follicles (77.8% vs. 23.1%; $p = 0.030$), absence of vellus hair (66.7% vs. 15.4%; $p = 0.043$) and peripheral pigmentation (100.0% vs. 46.2%; $p = 0.036$)

Table 4 Mucoscopy of discoid lupus erythematosus (DLE)

Dermoscopic characteristics	DLE $n = 2$
Morphology of vessels, *n* (%)	
Dotted	1 (50.0)
Linear	1 (50.0)
Linear with branches	2 (100.0)
Linear curved	2 (100.0)
Polymorphous	2 (100.0)
Distribution of vessels, *n* (%)	
Unspecific	2 (100.0)
Color of scales, *n* (%)	
White	1 (50.0)
Yellow	1 (50.0)
Distribution of scales, *n* (%)	
Patchy	2 (100.0)
Follicular findings, *n* (%)	
Follicular plugs	1 (50.0)
Morphologies/colors, *n* (%)	
White structureless areas	2 (100.0)
Red structureless areas	2 (100.0)
Red dots/globules	2 (100.0)
White lines	1 (50.0)
Specific clues, *n* (%)	
Erosion	1 (50.0)
Hemorrhagic areas	2 (100.0)

n number of patients

were significantly more frequent in late lesions than in lesions with a duration of less than 1 year.

In a combined analysis of all DLE plaques, lesions of longer duration showed significantly increased frequencies of white scaling (61.1% vs. 34.1%; $p = 0.042$), dotted and/or globular structures (58.3% vs. 24.4%; $p = 0.010$), gray-brown dots/globules (44.4% vs. 12.2%; $p = 0.015$) and peripheral pigmentation (58.3% vs. 24.4%; $p = 0.010$) when compared to lesions with a duration of less than 1 year.

Chilblain Lupus Erythematosus (CHLE)

Five patients were diagnosed with CHLE, and the hands (dorsal aspects and/or palms) were involved in all cases (Table 2, Fig. 4). Under dermoscopy, dotted vessels with an unspecific distribution were observed in all subjects (100%), and they were accompanied by linear, linear branched or linear curved vessels in 3 (60%) cases. White scales were a frequent finding (80%). Pink-red background was present in all cases, and red structureless (hemorrhagic) areas as well as red dots/globules were observed in the majority of cases (80% and 60%, respectively). Detailed dermoscopic findings are presented in Table 2.

Lupus Erythematosus Profundus (LEP)

One patient diagnosed with LEP involving the breast (lupus mastitis) was identified during the search (Tables 1 and 2). Under dermoscopy, polymorphous vessels (linear, linear branched and linear curved vessels) with an unspecific distribution and patchy white-yellow scales were observed. Other dermoscopic findings included follicular plugs, white structureless areas and red structureless (hemorrhagic) areas (Fig. 5).

DISCUSSION

Dermoscopic and trichoscopic features of DLE have been analyzed in several studies in various populations [8–22]. However, those analyses were predominantly conducted in individuals with dark-skinned phototypes (III and higher) [10, 11, 13–19]. In the study by Salah [10], carried out in Egyptian patients, scalp DLE was found to predominantly show scales, follicular plugs, a reduced number of ostia, pigmentation and white structureless areas. On the other hand, perifollicular white halos and follicular

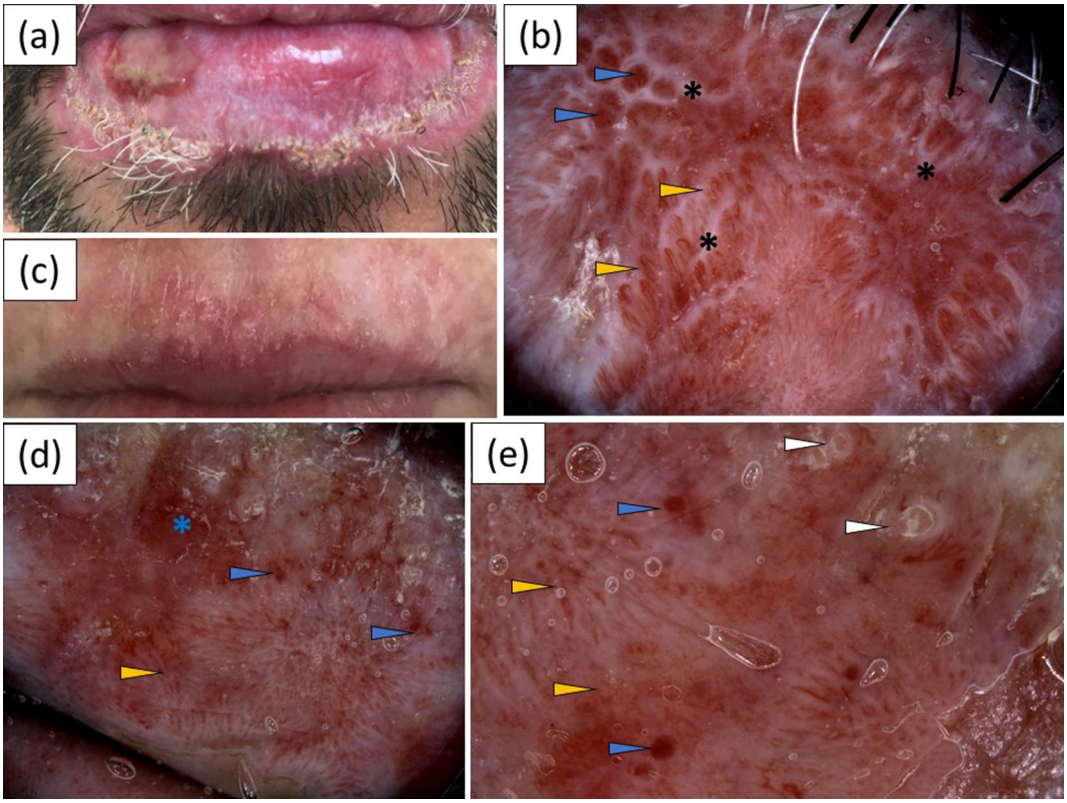

Fig. 3 **a** Clinical presentation of labial DLE with erosion. **b** Videodermoscopy showing numerous linear curved/hairpin vessels (*yellow arrowheads*), intersecting white lines (*black asterisks*) corresponding to epidermal hyperplasia and separating red globular structures (*blue arrowheads*). **c** Clinical presentation of DLE involving the vermillion border and the upper lip. **d** Videodermoscopy showing irregular dotted and linear vessels (*yellow arrowhead*), red structureless/hemorrhagic areas (*blue asterisk*) and red hemorrhagic globules (*blue arrowheads*). **e** Videodermoscopy showing follicular plugs at the vermillion border (*white arrowheads*), polymorphous vessels (*yellow arrowheads*) and red hemorrhagic globules (*blue arrowheads*)

plugs were detected in the majority of DLE lesions on the face.

In this paper, we analyzed the dermoscopic spectrum of DLE in white individuals in south-eastern Poland. We also performed a more systematic analysis of the dermoscopic characteristics, using the predefined parameters developed by the International Dermoscopy Society [22]. In our population, face was the most frequent site of involvement. DLE plaques beyond the scalp showed predominantly polymorphous vessels, pink-red background, follicular plugs, and white scales, followed by perifollicular white halos, red hemorrhagic areas, rosettes, white structureless areas and gray-brown dots/globules. DLE lesions located on the scalp or eyebrows demonstrated polymorphous vessels, hair diameter diversity, follicular plugs, yellow dots and a reduced number of follicles.

Several authors highlighted differences in dermoscopic presentation between early and late-stage DLE [10, 11, 21]. In a study by Gómez-Quispe et al. [11], early scalp DLE showed features of pigment incontinence and thin vessels significantly more frequently than long-standing lesions, which, on the other hand, commonly presented with shiny white structures (chrysalids and rosettes). The authors also observed a higher frequency of a thin vascular pattern in patients with positive antinuclear antibodies (ANA). In the study by Salah [10],

Table 5 Dependence of frequencies of individual dermoscopic findings on the duration of discoid lupus erythematosus (DLE) lesions

Dermoscopic characteristics	DLE								
	Total			DLE beyond scalp			Scalp and eyebrow DLE		
	≤ 12 months *n* = 41	> 12 months *n* = 36	*p* value	≤ 12 months *n* = 28	> 12 months *n* = 27	*p* value	≤ 12 months *n* = 13	> 12 months *n* = 9	*p* value
Vessel morphology, *n* (%)									
Dotted	7 (17.1)	3 (8.3)	0.512	6 (21.4)	3 (11.1)	0.520	1 (7.7)	0 (0.0)	0.794
Linear	33 (80.5)	29 (80.6)	0.996	24 (85.7)	22 (81.5)	0.796	9 (69.2)	7 (77.8)	0.744
Linear with branches	24 (58.5)	25 (69.4)	0.413	17 (60.7)	17 (63.0)	0.887	7 (54.8)	8 (88.9)	0.186
Thick	10 (24.4)	11 (30.6)	0.644	6 (21.4)	7 (25.9)	0.783	4 (30.8)	4 (44.4)	0.601
Thin	23 (56.1)	24 (66.7)	0.431	16 (57.1)	17 (63.0)	0.720	7 (54.8)	7 (77.8)	0.357
Linear curved	31 (75.6)	33 (91.7)	0.228	24 (85.7)	24 (88.9)	0.848	7 (54.8)	9 (100.0)	0.071
Polymorphous	34 (82.9)	32 (88.9)	0.659	26 (92.2)	23 (85.2)	0.634	8 (61.5)	9 (100.0)	0.144
Color of scales, *n* (%)									
White	14 (34.1)	22 (61.1)	**0.042**	12 (42.9)	20 (74.1)	**0.047**	2 (15.4)	2 (22.2)	0.794
Yellow	11 (26.8)	8 (22.2)	0.733	10 (35.7)	6 (22.2)	0.398	1 (7.7)	2 (22.2)	0.601
Follicular findings, *n* (%)									
Rosettes	8 (19.5)	14 (38.9)	0.146	7 (25.0)	11 (40.7)	0.319	1 (7.7)	3 (33.3)	0.324
Follicular plugs	23 (56.1)	26 (72.2)	0.228	18 (64.3)	19 (70.4)	0.707	5 (38.5)	7 (77.8)	0.126
Follicular red dots	5 (12.2)	4 (11.1)	0.939	4 (14.3)	4 (14.8)	0.980	1 (7.7)	0 (0.0)	0.794
Perifollicular white halo	9 (22.0)	15 (41.7)	0.138	9 (32.1)	12 (44.4)	0.437	0 (0.0)	3 (33.3)	0.209
Perifollicular pigmentation	5 (12.2)	4 (11.1)	0.939	2 (7.1)	2 (7.4)	0.993	3 (23.1)	2 (22.2)	1.000
Perifollicular scaling	4 (9.8)	7 (19.4)	0.468	3 (10.7)	5 (18.5)	0.990	1 (7.7)	2 (22.2)	0.601
Morphologies/colors, *n* (%)									
White structureless areas	8 (19.5)	11 (30.6)	0.407	7 (25.0)	10 (37.0)	0.447	1 (7.7)	1 (11.1)	0.896
Pink structureless areas	7 (17.1)	14 (38.9)	0.102	6 (21.4)	10 (37.0)	0.327	1 (7.7)	4 (44.4)	0.164
Dots/globules	10 (24.4)	21 (58.3)	**0.010**	8 (28.6)	18 (66.7)	**0.015**	2 (15.4)	3 (33.3)	0.512
Red globules	1 (2.4)	6 (16.7)	0.288	1 (3.6)	6 (22.2)	0.237	0 (0.0)	0 (0.0)	-
Gray-brown dots/globules	5 (12.2)	16 (44.4)	**0.015**	3 (10.7)	13 (63.0)	**0.016**	2 (15.4)	3 (33.3)	0.512
White lines	1 (2.4)	5 (13.9)	0.390	1 (3.6)	5 (18.5)	0.344	0 (0.0)	0 (0.0)	-
Specific clues, *n* (%)									
Peripheral pigmentation	10 (24.4)	21 (58.3)	**0.010**	4 (14.3)	12 (44.4)	0.056	6 (46.2)	9 (100.0)	**0.036**
Erosion	8 (19.5)	7 (19.4)	0.996	7 (25.0)	7 (25.9)	0.953	1 (7.7)	0 (0.0)	0.794

Table 5 continued

Dermoscopic characteristics	DLE								
	Total			DLE beyond scalp			Scalp and eyebrow DLE		
	≤ 12 months $n = 41$	> 12 months $n = 36$	*p* value	≤ 12 months $n = 28$	> 12 months $n = 27$	*p* value	≤ 12 months $n = 13$	> 12 months $n = 9$	*p* value
Red hemorrhagic areas	10 (24.4)	13 (36.1)	0.368	9 (32.1)	12 (44.4)	0.437	1 (7.7)	4 (44.4)	0.164
Follicular findings, *n* (%)									
Absence of openings	–	–	–	–	–	–	2 (15.4)	5 (55.6)	0.126
Yellow dots	–	–	–	–	–	–	6 (46.2)	6 (66.7)	0.431
Black dots	–	–	–	–	–	–	1 (7.7)	1 (11.1)	0.896
Reduced number of follicles	–	–	–	–	–	–	3 (23.1)	7 (77.8)	**0.030**
Hair shafts, *n* (%)									
Hair diameter diversity	–	–	–	–	–	–	8 (61.5)	4 (44.4)	0.512
Broken hair	–	–	–	–	–	–	0 (0.0)	6 (66.7)	0.209
Circular hair	–	–	–	–	–	–	2 (15.4)	0 (0.0)	0.556
Absence of vellus hair	–	–	–	–	–	–	2 (15.4)	6 (66.7)	**0.043**

n number of lesions; statistically significant *p* values in bold

early DLE lesions showed the presence of follicular plugs and perifollicular white halos, while late (end-stage) plaques were characterized by white structureless areas and teleangiectasia.

In our study, although we observed an increased presence of follicular plugs, perifollicular white halos, perifollicular scaling, white or pink structureless areas and red hemorrhagic areas in DLE plaques with durations of longer than 1 year, the differences did not reach statistical significance. Similar to the study by Gómez-Quispe et al. [11], shiny white structures, namely rosettes and chrysalids, were more common in lesions of longer duration, but again the results were not statistically significant. On the other hand, we observed significantly higher frequencies of white scales, dotted and globular structures (gray-brown dots and globules in particular) and peripheral pigmentation in DLE plaques with durations of more than 1 year. Some authors believe that the features of pigment incontinence are particularly pronounced in dark-skinned individuals, but according to our observations, they are also common in fair-skinned patients, in whom they may be indicators of the disease duration.

There are also very few reports in the English language literature on dermoscopic findings in mucosal and labial DLE [10, 12]. Salah et al. [10] reported the presence of scaling, brown pigment spots, white structureless areas, teleangiectasia, bleeding spots and erosions in labial DLE. On the other hand, mucosal DLE showed the presence of white structureless areas, teleangiectasia and ulceration [10]. In a recent study by Jha et al. [12], whitish-red background, polymorphous vessels and yellow scales were observed in DLE-related cheilitis. In the current paper, we provide dermoscopic characteristics of two additional cases of labial DLE (Table 4, Fig. 3). Interestingly, in one of the cases, we observed extensive white lines, which may lead to the misdiagnosis of lichen planus (LP). Our observations are in line with the results of the study by Jha et al. [12]. Although radiating white lines were most commonly detected in LP, they were also present in other types of

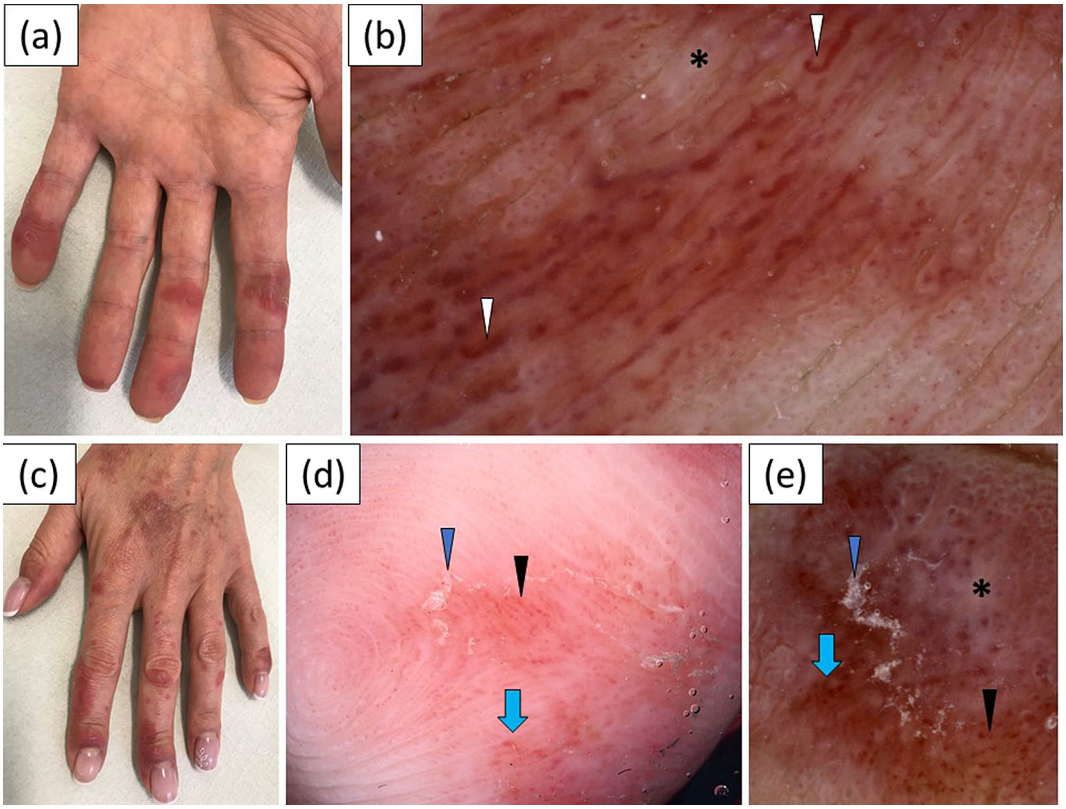

Fig. 4 **a**, **c** Chilblain lupus erythematosus (CHLE) involving the palmar and dorsal surfaces of the fingers—clinical presentation; **b**, **d**, **e** Videodermoscopy showing dotted vessels (*black arrowheads*) and linear curved vessels (*white arrowheads*) with an unspecific distribution, peripheral white scaling (*blue arrowheads*), red hemorrhagic globules (*blue arrows*) and whitish structureless areas (*black asterisks*)

cheilitis and should not be treated as a pathognomonic finding for LP.

After an extensive literature review, we have not encountered any reports of dermoscopic findings in CHLE or LEP. Both clinical variants are much less common than DLE. LEP is associated with the involvement of deep dermis and adipose tissue; therefore, we do not expect dermoscopy to play a significant role in the differential diagnosis, except for the detection of dermoscopic features of coexisting DLE. CHLE needs to be differentiated from lupus pernio (sarcoidosis), perniosis, and recently distinguished COVID-19-associated chilblains [23]. Undoubtedly, the role of dermoscopy in differentiating between these conditions needs further studies.

In the current paper, we provide a systematic description of the dermoscopic findings in DLE plaques in fair-skinned individuals as well as the location and duration of the lesions. We present novel dermoscopic features of CHLE and LEP. Limitations of the study include its single-center and retrospective design. The lack of a control group also prevented evaluation of the diagnostic usefulness of the dermoscopic findings. The diagnosis of CCLE was histologically confirmed in each study participant, but both biopsied and nonbiopsied lesions were included in the dermoscopic analysis. Only one patient with DLE had coexistent SLE, so an analysis of dermoscopic features suggesting systemic disease was not possible.

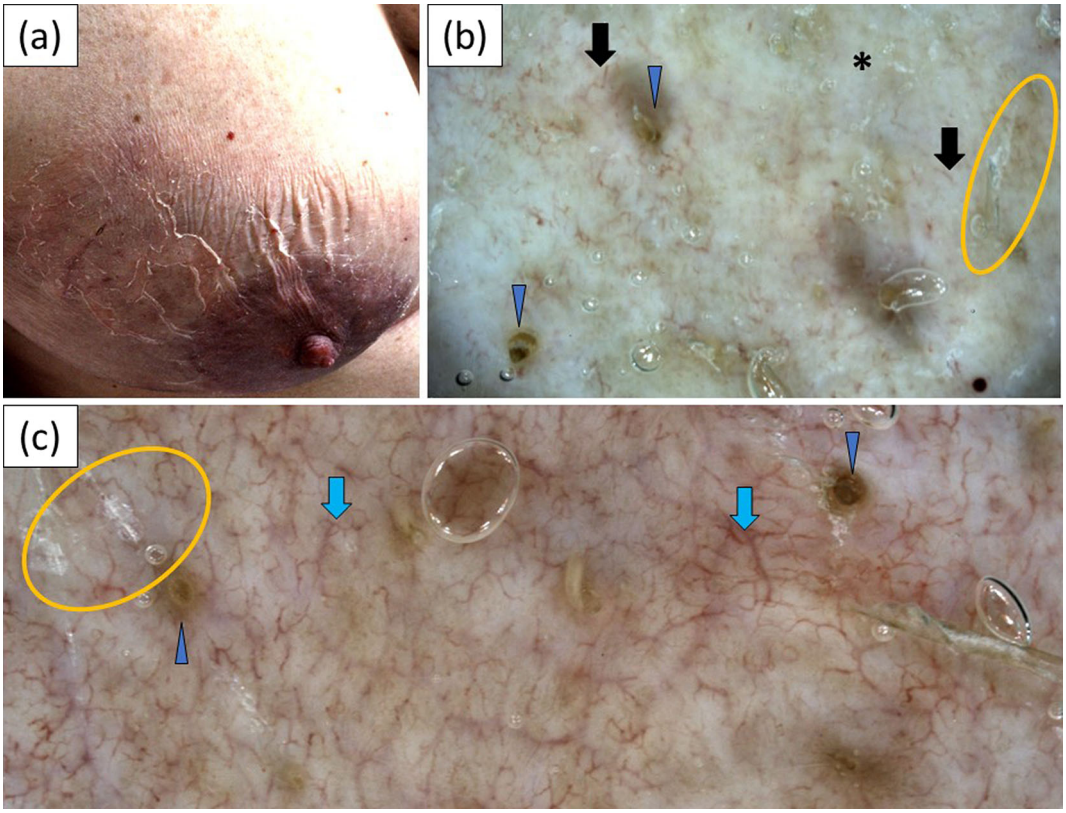

Fig. 5 **a** Lupus erythematosus profundus (LEP) involving the right breast—clinical presentation; **b**, **c** Videodermoscopy showing follicular plugs (*blue arrowheads*), linear (*black arrows*) and linear branched (*blue arrows*) vessels, white scaling with a patchy distribution (*yellow circles*), and white structureless areas (*black asterisks*)

CONCLUSIONS

Dermoscopy might be useful in the preliminary diagnosis of DLE, and it is a valuable tool in the assessment of disease duration. Its role in the diagnosis of other variants of CCLE, namely CHLE and LEP, needs further elucidation.

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Compliance with Ethics Guidelines. The research was conducted in accordance with the Declaration of Helsinki and was approved by the University of Rzeszow Ethics Committee. Informed consent was obtained from the patients for participation in the study and the publication of the article, including the publication of clinical photographs. We would like to thank the study participants for their involvement.

Data Availability. The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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