Dermoscopic criteria of discoid lupus erythematosus: An observational cross-sectional study of 28 patients

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Abstract

Background: Discoid lupus erythematosus (DLE) affects mainly the head and neck and lesions heal with scaring. Early diagnosis of DLE is crucial; dermoscopy may enable early diagnosis and help to assess the prognosis of well-established lesions.

Aims: To describe the dermoscopic features of DLE and to correlate them with the histological findings, site and duration of DLE.

Material and Method: This study included 28 patients diagnosed as DLE based on clinical and histopathological examination. We examined the lesions clinically, dermoscopically and histopathologically. Evaluated dermoscopic variables were based on data in the available literature and on our observations.

Results: Whitish scales (89.3%), arborizing blood vessels (85.7%), follicular plugging (82.1%), and pigmentation (82.1%) were the commonest dermoscopic findings. Radial arrangement of arborizing blood vessel in between a radially arranged perifollicular whitish halo (starburst pattern) (39.3%) was noticed for the first time in this study. Rosettes (57.1%) were also seen. There was significant agreement between many dermoscopic and pathological findings with high sensitivity and specificity of many dermoscopic variants in the diagnosis of DLE. Follicular plugging, perifollicular whitish halo, starburst pattern, follicular red dots and rosettes were detected in early stages of the disease but structureless whitish areas and telangiectasia need more time to develop.

Limitations: We examined our patients at the time of presentation only without prospective monitoring and we had a relatively small sample size.

Conclusion: Dermoscopy helps in the diagnosis of DLE at different body sites.

Key words: Dermoscopy, discoid lupus, histopathology of discoid lupus erythematosus, rosettes, starburst pattern

Introduction

Discoid lupus erythematosus (DLE) is a subtype of chronic cutaneous lupus erythematosus affecting mainly the face and scalp in localized disease,[1] but widespread involvement on the trunk and limbs may be seen.[2] Dermoscopy is a non invasive, rapid and simple tool[3] that helps in the early diagnosis of DLE resulting in better response to treatment and prevention of scarring.[4]

Material and Method

This was an observational cross-sectional study of 28 patients [Table 1], done between October 2015 and November 2016 at the dermatology outpatient clinic of Mansoura University, Egypt. All included patients were diagnosed as DLE based on clinical and histopathological examination. All studied patients had no clinical signs or symptoms suggestive of SLE, and were negative for antinuclear antibodies (ANA). All included patients had typical DLE lesions. Patients who had received topical therapy in the previous month or systemic therapy in the 6 months before recruitment were excluded. We also excluded lesions without a definite histopathological diagnosis of DLE. Consent was taken from all patients before inclusion in the study. This study was done with the approval of the Committee of Research and Ethics and the Scientific Committee.

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Table 1: Demographics and clinical data of the studied cases

Demographics and clinical data	values
Duration of disease (years), median (minimum-maximum)	1.75 (0.08-21.0)
Age (years), mean±SD	39.74±8.79
Sex, *n* (%)	
Female	20 (71.5)
Male	8 (28.5)
Site of lesion, *n* (%)	
Nonscalp*	14 (50.0)
Scalp	14 (50.0)
Total, *n* (%)	28 (100.0)

*12 face, 1 arm, 1 chest. SD: Standard deviation

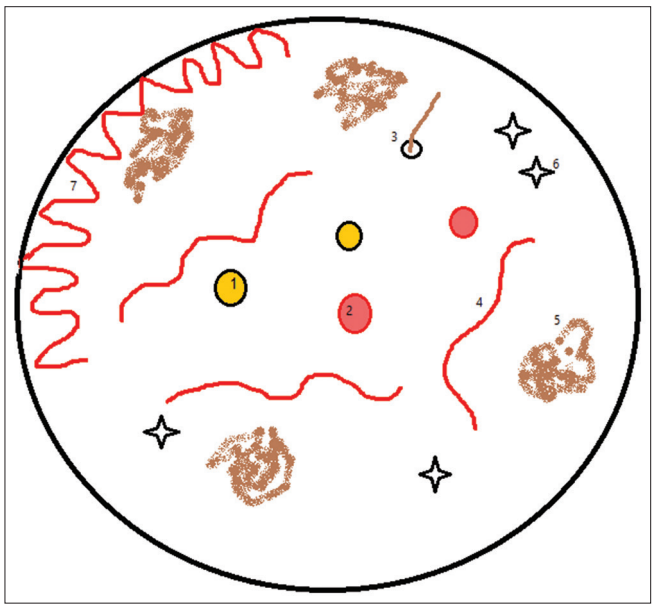

Figure 1: Dermoscopic features of discoid lupus erythematosus. (1) follicular plugging, (2) follicular red dots, (3) perifollicular whitish halo, (4) linear blood vessels, (5) pigmentation, (6) rosettes, and (7) starburst pattern

All patients were subjected to detailed history taking, general examination and detailed dermatological examination. Dermoscopic examination using polarized light (30×) was done and then a skin biopsy of the same lesion was taken. All slides were stained with hematoxylin and eosin and were examined by the third author. Dermoscopic images were evaluated by the fourth author followed by the second author and finally by the first author in the case of disagreement. Dermoscopic variables used in the evaluation process were those reported previously with DLE lesions in addition to our preliminary observations as in Table 2 [Figure 1][5,6]. The study adopted the terminology approved in the last International Dermoscopy Society consensus[7]. Variables included in our histopathological examination are shown in Table 3.

Data were analyzed using IBM SPSS software package version 20.0. Tests used were Mann–Whitney U test, validity indices like sensitivity, specificity, positive predictive rate, negative predictive rate and reliability**.** Kappa coefficient was used to describe the agreement between categorical variables.

Table 2: Dermoscopic features of the studied discoid lupus erythematosus lesions (*n*=28)

Dermoscopy*	*n* (%)
White patchy scales	25 (89.3)
Linear blood vessels	24 (85.7)
Follicular plugging	23 (82.1)
Speckled pigmentation	23 (82.1)
Perifollicular whitish halo	19 (67.9)
Structureless whitish areas	19 (67.9)
Rosette	16 (57.1)
Starburst pattern	11 (39.3)
Follicular red dots	10 (35.7)

*Categories are not mutually exclusive

Table 3: Pathology results of studied discoid lupus erythematosus lesions

Pathology*	*n* (%)
Vacuolar interface dermatitis	28 (100)
Periadenexal lymphoid infiltrate	28 (100)
Follicular hyperkeratosis	24 (85.7)
Telangiectasia	24 (85.7)
Dermal fibrosis	23 (82.1)
Pigmentary incontinence	22 (78.6)
Surface hyperkeratosis	21 (75)
Perifollicular fibrosis	21 (75)
Dermal mucin deposition	19 (67.9)
Atrophy	16 (57.1)
Spotty parakeratosis	13 (46.4)
Perifollicular red blood cells	10 (35.7)

*Categories are not mutually exclusive

Results

Of the 28 studied patients, 20 (71.4%) were females and 8 (28.5%) were males; mean age was 39.7 ± 8.8 years. Fourteen (50%) patients had scalp lesions, 12 (42.9%) patients had lesion on the face, one (3.6%) on the chest and one (3.6%) on the arm. The median duration of lesions was 1.8 years [Table 1]. On dermoscopy, whitish patchy scales (25 cases, 89.3%) were the commonest finding followed by linear blood vessels (24, 85.7%) then follicular plugging (23, 82.1%) and pigmentation (23, 82.1%). Perifollicular whitish halos were observed in 19 (67.9%), white structureless areas in 19 (67.9%), rosettes in 16 (57.1%), a starburst pattern in 11 (39.3%) and follicular red dots in 10 (35.7%) of the studied patients [Table 2] [Figure 1]. Histopathology showed vacuolar interface dermatitis and periadenexal and perifollicular lymphoid infiltrate in 28 (100%) patients, follicular hyperkeratosis in 24 (85.7%), telangiectasia in 24 (85.7%), dermal fibrosis in 23 (82.1%), pigmentary incontinence in 22 (78.6%), perifollicular fibrosis in 21 (75%), surface hyperkeratosis in 21 (75%), dermal mucin deposition in 19 (67.9%), atrophy in 16 (57.1%),

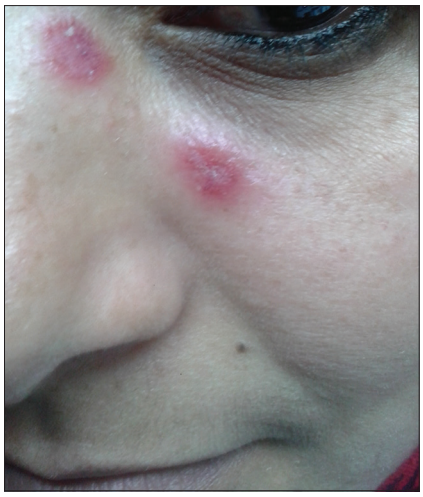

Figure 2a: Recent-onset discoid lupus erythematosus lesion on the face

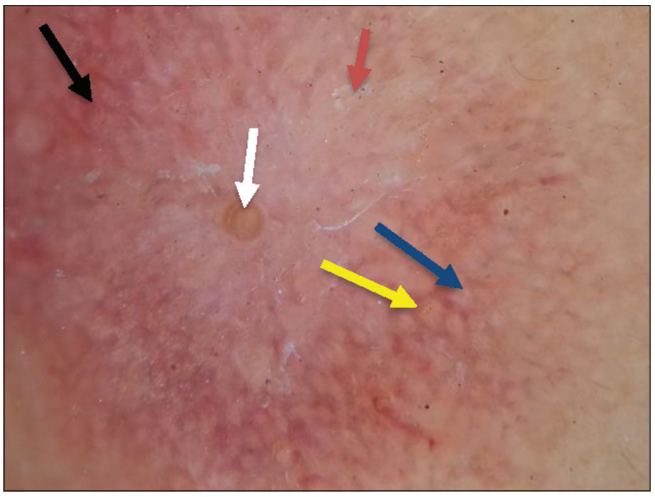

Figure 2b: Follicular plugging (white arrow), follicular red dots which suggest perifollicular inflammation which in turn indicates active disease (black arrow), whitish patchy scales (red arrow), starburst pattern (yellow arrow) and rosettes (blue arrow) (polarised × 30)

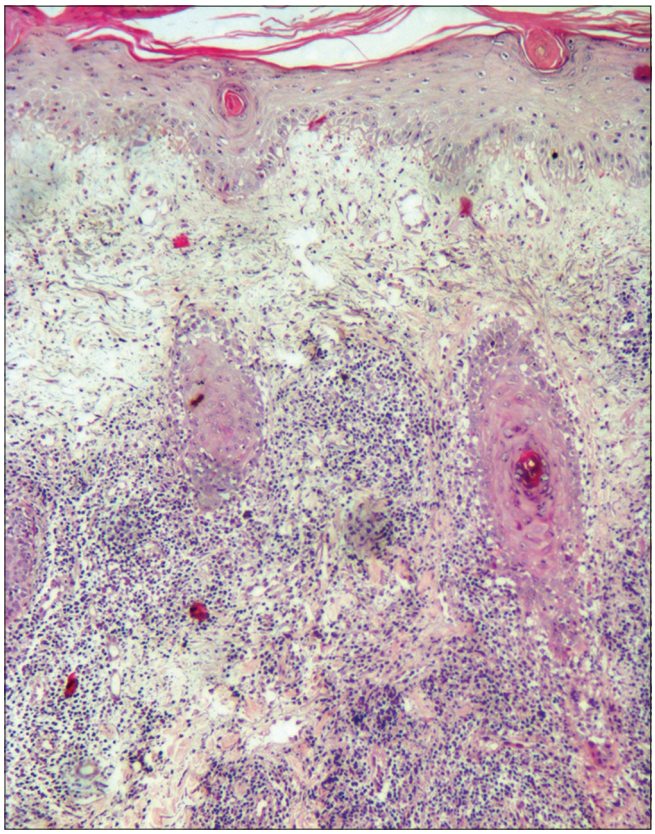

Figure 2c: Surface hyperkeratosis, follicular hyperkeratosis, vacuolar interface dermatitis, perifollicular lymphoid infiltrate, wide dermal blood vessels and dermal mucin deposition (H and E, ×100)

spotty parakeratosis in 13 (46.4%) and perifollicular red blood cells in 10 (35.7%) patients [Table 3]. The results show significant agreement between many of the dermoscopic and pathological findings with high sensitivity especially for follicular plugging, linear blood vessels, scales, pigmentation and follicular red dots and high specificity for follicular plugging, perifollicular whitish halo, follicular red dots and linear blood vessels in the diagnosis of DLE [Table 4]. The study shows that follicular plugging, follicular red dots and starburst pattern [Figures 2,3] are abundant in lesions with short history in contrast to linear blood vessels and structureless whitish areas which are more in lesions with long history [Table 5], [Figures 4, 5, 6]. With respect to the site of the DLE lesions, follicular plugging, perifollicular whitish halos and a starburst pattern showed highly significant correlations for lesions outside the scalp [Figures 2,5] in contrast to structureless whitish areas which appeared more on scalp lesions [Table 6], [Figures 3, 4].

Discussion

Dermoscopy of the studied DLE lesions showed that whitish patchy scales, linear blood vessels, follicular plugging and pigmentation were the most frequent findings [Figures 4,5]. A previous study with a larger sample size and shorter duration than our study which included lesions outside the scalp reported that perifollicular whitish halos, follicular plugging and telangiectasia were the most frequent findings in DLE.[5] Large yellow dots, thick arborizing vessels and scattered dark brown discolouration of the skin were reported to be the most characteristic features of scalp DLE.[8] Perifollicular whitish halos, white structureless areas [Figure 6] and follicular red dots [Figures 2,3] were found in this study, in agreement with previous studies.[5,6]

Rosettes [Figures 2,3] were a dermoscopic finding in recent-onset DLE lesions in our study (16 patients, 57.1%). They were reported previously only in one patient in a previous report.[6] Another study recently described rosettes in 3 cases of DLE.[9] We tried to correlate rosettes on dermoscopy with spotty parakeratosis on histopathology which we thought might have caused the optical reaction with polarized light, but the results were insignificant. Follicular hyperkeratosis which occur at the middle of the hair follicle and the heavy infiltration around the sebaceous gland insertion have been suggested to be the source of the optical reaction but this was

Table 4: Validity and agreement between dermoscopic and pathological findings

Dermoscopy	Pathology	Kappa coefficient	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)	Accuracy (%)
Follicular plugging (*n*=23)	Follicular hyperkeratosis (*n*=24)	0.868*	95.8	100.0	100.0	80.0	96.4
Perifollicular whitish halo (*n*=19)	Perifollicular fibrosis (*n*=21)	0.652	85.7	85.7	94.7	66.67	85.7
Linear blood vessels (*n*=24)	Telangiectasia (*n*=24)	0.71*	95.8	75.0	95.8	75.0	92.8
Scales (*n*=25)	Hyperkeratosis (*n*=21)	0.29	95.2	28.6	80.0	66.7	78.6
Pigmentation (*n*=23)	Pigment incontinence (*n*=22)	0.66	95.5	66.7	91.3	80.0	89.3
Structureless whitish areas (*n*=19)	Dermal fibrosis (*n*=23)	0.258	73.9	60.0	89.5	33.3	71.4
Follicular red dots (*n*=10)	Perifollicular red blood cell extravasation (*n*=10)	0.844*	90.0	94.4	90.0	94.4	92.9
Rosettes (*n*=16)	Spotty parakeratosis (*n*=13)	0.22	69.2	53.3	56.2	66.7	60.7
Dermoscopy	Pathology	0.601	88.6	71.2	88.1	72.3	83.5

*Kappa coefficient >0.7 (*n*) out of 28

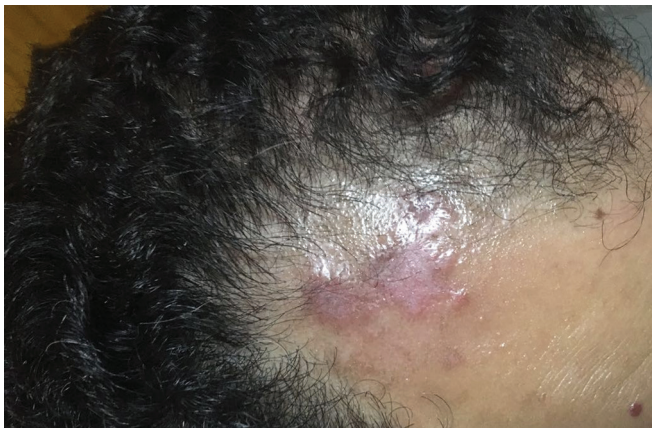

Figure 3a: A recent onset discoid lupus erythematosus lesion on the scalp

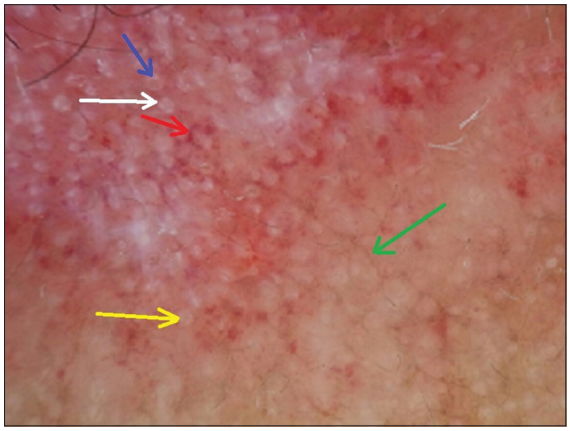

Figure 3b: Follicular plugging (blue arrow), follicular red dots (red arrow), rosettes (white arrow), whitish globules (yellow arrow), starburst pattern (green arrow) (polarised × 30)

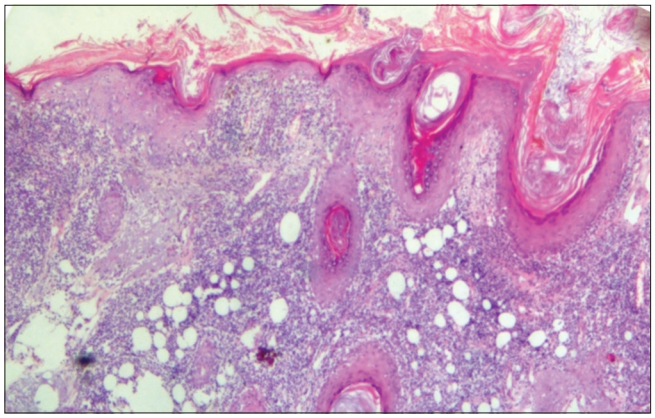

Figure 3c: Vacuolar interface dermatitis, dilated dermal blood vessel, dermal mucin deposition, extravasation of red blood cells (H and E,×100)

not based on statistical data.[9] Rosettes were also suggested to result from the optical effect of crossed polarisation with the horny material in smaller rosettes but perifollicular fibrosis is responsible for the larger ones which can be noticed in many tumours and inflammatory skin lesions including DLE; therefore, rosettes are not lesion-specific.[10]

A starburst pattern was a new dermoscopic feature of DLE in this study [Figures 2,3] (11 patients, 39.3%). We noticed that it was more frequent in recent-onset DLE lesions located outside scalp. This pattern may be related to the pathological changes due to inflammation (inflammatory infiltrate and dilated blood vessels) around hair follicles.

We found good correlation between many of our dermoscopic findings and their corresponding pathological findings. These findings are in agreement with a previous report.[5]The results of this study revealed high sensitivity of follicular plugging (95.8%) and linear blood vessels (95.8%) and high specificity of follicular plugging (100%) and follicular red dots (94.4%) to the diagnosis of DLE with overall 88.6% sensitivity, 71.2% specificity and 83.5% accuracy. These results are in agreement with a previous study regarding the sensitivity of the scalling and specificity of dermoscopy in detecting DLE with lower sensitivity of other findings such as follicular plugging, linear blood vessels, pigmentation and

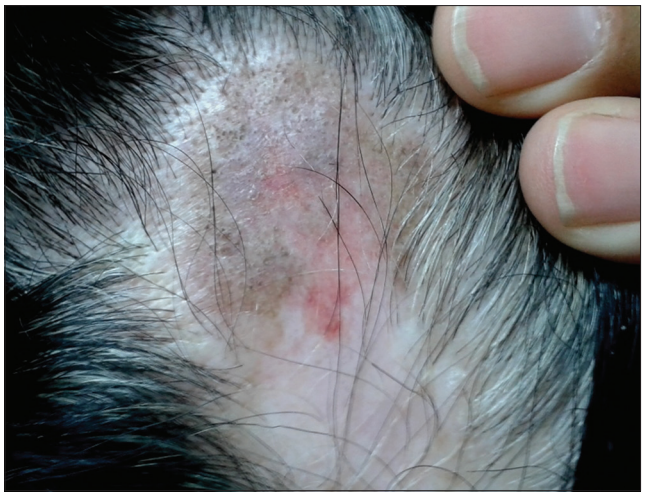

Figure 4a: A long-standing discoid lupus erythematosus lesion on the scalp

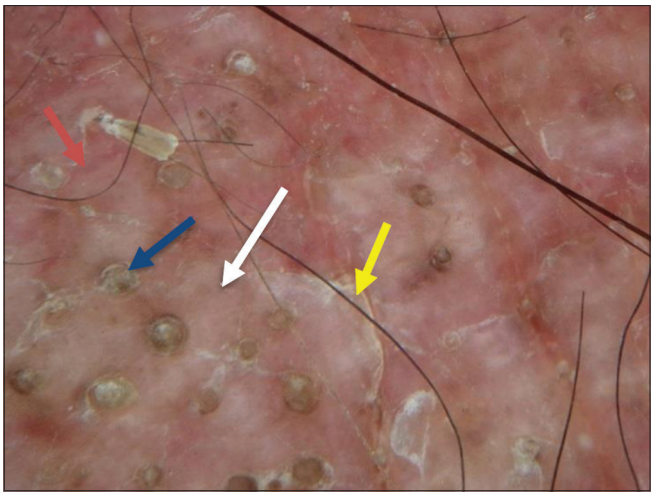

Figure 4b: Follicular plugging (blue arrow), telangiectasia (red arrow), whitish-pink background (white arrow) and whitish patchy scales (yellow arrow) (polarised × 30)

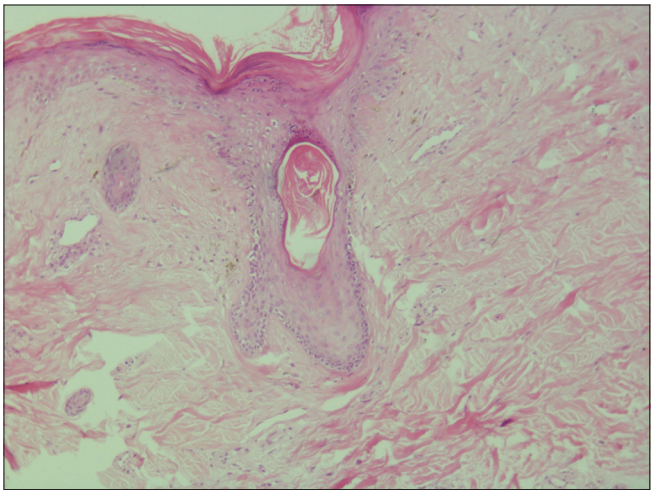

Figure 4c: Surface hyperkeratosis, follicular hyperkeratosis, vacuolar interface dermatitis, dilated blood vessels, periadenexal lymphoid infiltrate, pigment incontinence and fibrosis (H and E,×100)

follicular red dots.[11] However, they had a small sample size and included only DLE lesions located on the scalp.[11]

We found that dermoscopic findings of DLE differ according to disease duration. Follicular plugging, perifollicular whitish halos, starburst pattern, follicular red dots and rosettes are detected in the early stages of the disease but structureless whitish areas and telangiectasia apparently develop over time. These findings are consistent with the previous report.[5] Our study also showed that follicular plugging, perifollicular whitish halos, starburst pattern, follicular red dots and rosettes are more frequent in DLE lesions outside the scalp, in contrast to telangiectasia and white structureless areas which are more frequent in scalp lesions. This too is consistent with the previous report that included cases with DLE located only outside the scalp,[5] which the authors compared with studies of scalp DLE. Our study included both scalp and non-scalp lesions. These findings may be due to early presentation of patients with DLE on the face due to easy visibility of lesions and cosmetic concerns.

Table 5: Variation of duration of lesions according to dermoscopic findings

Dermoscopic characters	Duration (years), median (minimum-maximum)	Test of significance
Follicular plugging		
Absent	12.0 (4.0-20.0)	*Z*=2.7, *P*=0.008*
Present	1.0 (0.08-21.0)	
Perifollicular whitish halo		
Absent	3.0 (1.0-20.0)	*Z*=1.6, *P*=0.12
Present	1.0 (0.08-21.0)	
Linear blood vessels		
Absent	0.34 (0.16-1.0)	*Z*=2.1, *P*=0.03*
Present	2.5 (0.08-21.0)	
Scales		
Absent	4.0 (0.42-4.0)	*Z*=0.22, *P*=0.82
Present	1.5 (0.08-21.0)	
Pigmentation		
Absent	4.0 (0.25-20.0)	*Z*=0.33, *P*=0.74
Present	1.5 (0.085-21.0)	
Structureless whitish areas		
Absent	0.25 (0.08-3.0)	*Z*=3.22, *P*=0.001**
Present	4.0 (0.42-21.0)	
Follicular red dots		
Absent	4.0 (0.08-21.0)	*Z*=2.04, *P*=0.04*
Present	0.915 (0.16-3.0)	
Rosette		
Absent	4.0 (0.08-20.0)	*Z*=1.6, *P*=0.1
Present	1.0 (0.16-21.0)	
Starburst pattern		
Absent	4.0 (0.08-21.0)	*Z*=2.07, *P*=0.03*
Present	0.42 (0.16-10.0)	

**P*-value significant <0.05. *Z*: Mann-Whitney U-test

This study records the starburst pattern as a new feature of DLE. This finding was seen in 39.3% of DLE patients, especially in recent-onset and facial lesions. We also

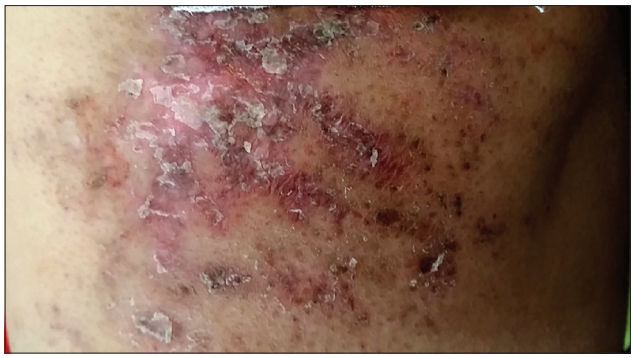

Figure 5a: Long-standing discoid lupus erythematosus lesion of the arm

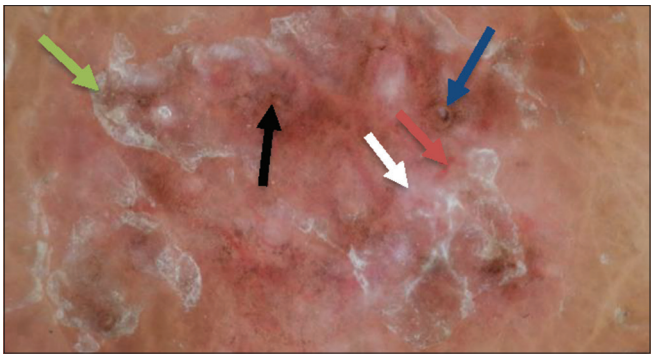

Figure 5b: Whitish globules indicate empty follicles (white arrow), arborizing blood vessels (red arrow), speckled pigmentation (black arrow), whitish scales (green arrow) and follicular plugging (blue arrow) (polarised × 30)

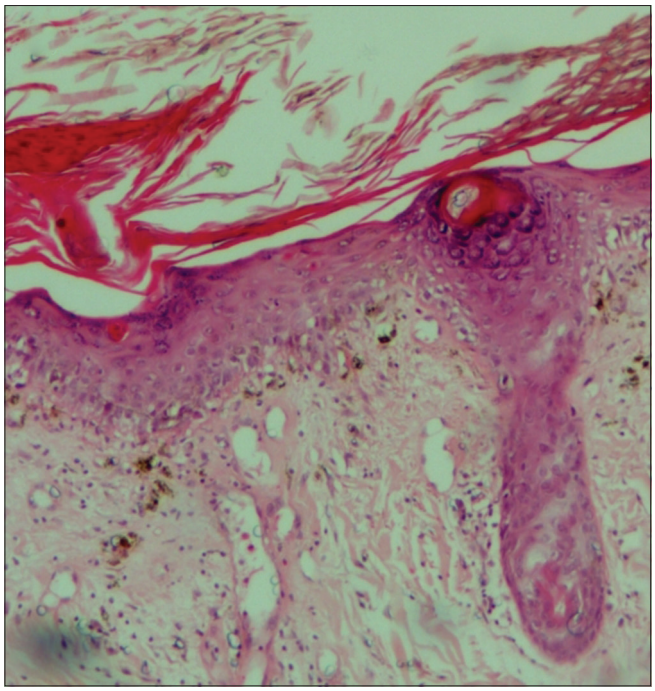

Figure 5c: Surface hyperkeratosis, spotty parakeratosis, follicular hyperkeratosis, periadenexal lymphocytic infiltrate, vacuolar interface dermatitis, dermal fibrosis, dilated dermal blood vessels and pigmentary incontinence (H and E, ×100)

frequently noted rosettes, a relatively new finding with only four previously reported cases in the literature.

DLE can be differentiated on dermoscopy from subacute cutaneous lupus which shows whitish scaling associated with mixed vascular pattern with the absence of pigmentation and follicular plugging.[12] Other inflammatory and granulomatous diseases can also be differentiated: sarcoidosis shows diffuse or localized, structureless, orange areas and well-focused linear or branching vessels; granuloma annulare shows unfocused vessels on a pinkish-reddish background and focal or diffuse yellowish-orange and whitish areas; cutaneous leishmaniasis is characterized by polymorphic vascularization, erythema, whitish or yellowish follicular plugs with rounded, oval, or tear-drop shape, white starburst-like pattern, scales and crusts[13] and lastly granuloma faciale shows prominent follicles, branching linear vessels and brown globules.[14]

Table 6: Dermoscopic characters according to lesion site (*n*=14)

Dermoscopic characters	Nonscalp, *n* (%)	Scalp, *n* (%)	Test of significance
Follicular plugging			
Absent	0 (0.0)	5 (35.7)	FET, *P*=0.04*
Present	14 (100.0)	9 (64.3)	
Perifollicular whitish halo			
Absent	2 (14.3)	7 (50.0)	4.09, *P*=0.043*
Present	12 (85.7)	7 (50.0)	
Linear blood vessels			
Absent	3 (21.4)	1 (7.1)	FET, *P*=0.59
Present	11 (78.6)	13 (92.9)	
Scales			
Absent	1 (7.1)	2 (14.3)	FET, *P*=1.0
Present	13 (92.9)	12 (85.7)	
Pigmentation			
Absent	2 (14.3)	3 (21.4)	FET, *P*=1.0
Present	12 (85.7)	11 (78.6)	
Structureless whitish areas			
Absent	8 (57.1)	1 (7.1)	χ^2=8.02, *P*=0.005**
Present	6 (42.9)	13 (92.9)	
Follicular red dots			
Absent	7 (50.0)	11 (78.6)	χ^2=2.5, *P*=0.15
Present	7 (50.0)	3 (21.4)	
Rosette			
Absent	4 (28.6)	8 (57.1)	χ^2=2.3, *P*=0.13
Present	10 (71.4)	6 (42.9)	
Starburst pattern			
Absent	3 (21.4)	14 (100.0)	FET, *P*<0.001**
Present	11 (78.6)	0 (0.0)	

**High statistically significant, **P* value significant <0.05. FET: Fischer's exact test, χ^2: Chi-square test

Limitations

We examined our patients at the time of presentation only with out prospective or retrospective monitoring of the effect of duration of the disease on each lesion. Also we included a

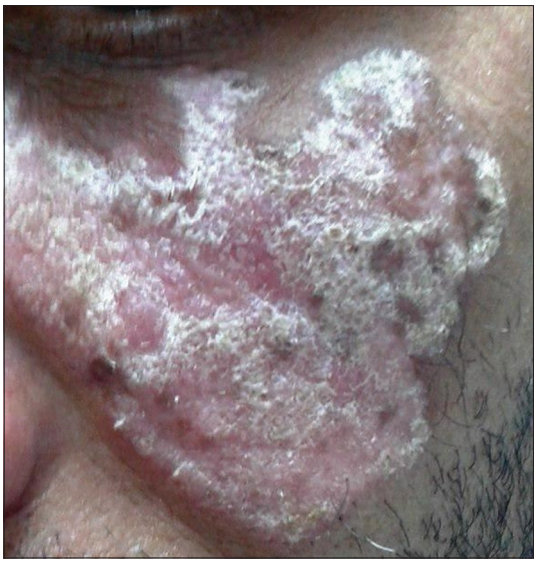

Figure 6a: Chronic discoid lupus erythematosus lesion on the face of 20 years duration

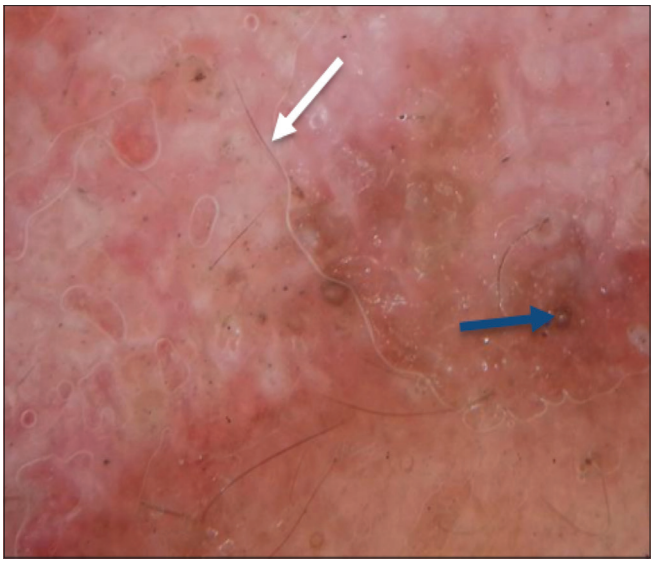

Figure 6b: Low number of follicular plugs (blue arrow) and whitish globules (white arrow) (polarised × 30)

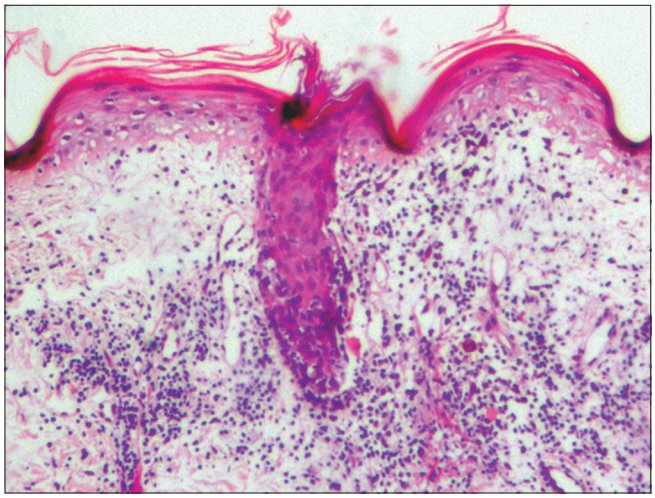

Figure 6c: Extensive surface and follicular hyperkeratosis, periadenexal lymphoid infiltrate, vacuolar interface dermatitis, dermal fibrosis and dilated dermal blood vessels (H and E,×200)

relatively small sample size. But the interesting point in our study is that it's the first study to include scalp and non scalp DLE cases in contrast to previous reports that included either scalp or non scalp DLE lesions.

Conclusion

Our study helps early diagnosis of DLE at different sites of the body. Early diagnosis and treatment result in decreasing the rate of scarring.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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