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Study of the Dermoscopic Findings and Their Correlation with Histopathological Findings in Various Lichenoid Dermatoses

Preeti Garg[1], **Tejinder Kaur**[1*], **S. K. Malhotra**[1] **and Amarjit**[2]

[1]*Department of Dermatology, Venereology and Leprosy Government Medical College, Amritsar, Punjab, India*

[2]*Department of Pathology Government Medical College, Amritsar, Punjab, India*

[*]**Corresponding Author**: Kaur T, Department of Dermatology, Venereology and Leprosy Government Medical College, C-12, Medical College Campus, Near Circular Road, Amritsar, Punjab, India – 143001, Tel: +91-9815514499; E-mail: tejinderkaurdr@gmail.com

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Abstract

Background: Lichenoid disorders are often difficult to diagnose clinically. Dermoscopy can act as an alternative technique to skin biopsy for diagnosis of various lichenoid dermatoses.

Study aim: To study the correlation of dermoscopic with histopathological findings in various lichenoid dermatoses Methods: Fifty patients with clinical picture of lichenoid dermatoses were examined first under the dermoscope, followed by skin biopsy from the same site. The findings of both methods were recorded and correlated.

Results: Nonvascular findings were the predominant features on dermoscopy out of which white structures were present in 93.33% of patients of classical lichen planus, 50% of actinic lichen planus, 90% of lichen planus hypertrophicus, 50% of lichen planopilaris and in only the case of lichen simplex chronicus. In classical lichen planus patients, a particular pattern of white structures with linear streaks arranged in a radial manner (starburst pattern) was observed. In lichen planus, it is suggested that the white structures on dermoscopy corresponded histologically to hyperkeratosis. Gray-blue dots or brown punctate areas represented melanophages in dermis. In lichen planus pigmentosus and ashy dermatosis patients, no specific patterns could be observed. In lichen planus hypertrophicus, white structures, corn pearls and comedolike openings appeared to represent hyperkeratosis and hypergranulosis, while pigmentation of variable colors could be due to presence of melanophages in the dermis.

Conclusion: Dermoscopy can be a valuable tool for the dermatological diagnosis and may obviate need for skin biopsy.

Keywords: Dermoscopy; Lichenoid dermatoses; Histopathology

Introduction

'Lichenoid dermatoses' is a term used to describe various dermatological conditions which share clinical and/or histopathological features with those of lichen planus [1]. Because of these overlapping features it is often difficult to fit them in particular diagnosis.

Dermoscope is a recent, non-invasive diagnostic tool which visualizes subtle clinical patterns of skin lesions and subsurface skin structures not normally visible to the unaided eye. Its use is being explored in other dermatoses apart from malignant melanoma. The dermoscopic patterns observed consistently in certain diseases can be used for clenching diagnosis [2,3].

The aim of present study was to correlate dermoscopic with histopathological findings in various lichenoid dermatoses.

Methods

The study was approved by ethical committee. Fifty patients with clinical picture suggestive of lichenoid dermatoses were selected for the study. Before initiating the procedure, a pre informed written consent was taken and recorded. After that, a detailed history of the patient was taken; clinical examination, routine and other relevant investigations were carried out and recorded in a prestructured proforma. Patients having any active infection, application of any topical preparation over the lesion, any breech in the skin surface due to external cause, non-cooperative patient, bleeding diathesis, sensitivity to lignocaine/local anaesthetic and lesions over the mucous membrane were excluded from the study.

The lesion was selected, photographed and observed through the dermoscope and a 4 mm punch biopsy was taken from the same site in 10% formalin and sent to the pathology department for haematoxylin and eosin (H&E) staining. The dermoscope used was a handyscope attached with iPhone6 (HS5-0091) from a German company FotoFinder. It gives an optical magnification of upto 20X with the quality of auto-focus and presence of several lenses. With its unique twin light system and six polarized and six white LEDs, the handyscope combines the advantages of cross-polarized light and immersion fluid dermoscopy. All images along with patient details were recorded in the inbuilt software provided with the system. Different dermoscopic patterns of lesions in lichenoid dermatoses were observed. Depending upon the pathological findings, the lesion was characterised under a specific lichenoid dermatosis. The dermoscopic

findings were correlated with the biopsy findings. The results were tabulated and statistically analysed using at the end of the study.

Results

Patients

Out of fifty cases, 33 (66%) were in the age group of 20-59 years (mean age-38.14 years, range 13-80 years). There were 35 females and 15 males (M:F-0.43:1). The mean duration of illness was 16.89 ± 24.58 months (0.5-120 months). Majority of patients were housewives (21/50, 42%) followed by students (9/50, 18%). History of drug intake for a variable duration of time was present in 9 (18%) out of fifty patients with lichenoid disorders. Out of these 9 patients, five had history of intake of anti-hypertensive drugs (beta-blockers), two patients had homeopathic medication, one patient was taking some oral medication for enteric fever and one patient was on Anti-Tubercular Therapy (ATT). Amongst the group of patients with other associated diseases , one (2%) out of fifty patients was found to be positive for anti-hepatitis C antibody and one patient (2%) was reactive for human immunodeficiency virus (HIV) infection. While two patients (4%) were having lesions of vitiligo along with those of lichenoid disorder and one patient (2%) was found to have hypothyroidism.

Type of Lichenoid Disorder	Total number of cases	Percentage
Classical Lichen Planus (CLP)	15	30
Actinic Lichen Planus (ALP)	2	4
Lichen Planus Pigmentosus (LPP)	7	14
Ashy Dermatosis (AD)	4	8
Lichen Planus Hypertrophicus (LPH)	10	20
Lichen Planopilaris (LPPilaris)	2	4
Lichen Simplex Chronicus (LSC)	1	2
Polymorphic light eruption (PLE)	1	2
Others (Non-specific)	8	16
Total	50	100

Table 1: Types of lichenoid dermatoses with frequencies included in study.

Dermoscopic Findings

Type of pattern	CLP	ALP	LPP	AD	LPH	LPPilaris	LSC
	(n=15)	(n=2)	(n=7)	(n=4)	(n=10)	(n=2)	(n=1)
	(n%)	(n%)	(n%)	(n%)	(n%)	(n%)	(n%)
Vascular							
Diffuse	1 (6.67)	0	0	0	0	0	0
Dotted	5 (33.33)	0	0	0	3 (30)	0	1 (100)
Mixed	0	0	0	0	0	0	0
Nonvascular							
Diffuse	13 (86.67)	2 (100)	3 (42.85)	2 (50)	10(100)	2(100)	1 (100)
Dotted	4 (26.67)	0	3 (42.85)	3 (75)	0	0	0
Mixed	1 (6.67)	0	1 (14.28)	0	0	0	0

Table 2: Showing types of patterns observed on dermoscopy in the study cases.

On dermoscopy, different patterns, which were further divided into vascular and nonvascular findings, were observed (Table 2). Dermoscopic findings observed in various lichenoid disorders have been described in Table 3. Among these patterns, nonvascular pattern was found in majority of patients.

Dermoscopic finding	CLP (n=15) (n%)	ALP (n=2) (n%)	LPP (n=7) (n%)	AD (n=4) (n%)	LPH (n=10) (n%)	LPPil (n=2) (n%)	LSC (n=1) (n%)
Vascular findings							
Red dots	3 (20)	0	0	0	2 (20)	0	1 (100)
Red globules	2(13.33)	0	0	0	1 (10)	0	0
Nonvascular findings							
White structures	14(93.33)	1(50)	0	0	9 (90)	1 (50)	1 (100)
Brownish dots	3 (20)	0	3(42.86)	2 (50)	0	0	0
Grey-blue dots	2 (13.33)	0	0	1 (25)	0	0	0
White globules	0	1 (50)	4(57.14)	0	0	0	0
Corn pearls	2 (13.33)	0	0	0	2 (20)	0	0
Comedo-like openings	3 (20)	0	0	0	5 (50)	0	0
Milium-like cysts	1 (6.67)	0	0	0	0	0	0
Pigmentation							
Brown	3(20)	2(100)	2(28.57)	0	2(20)	2(100)	0
Greyish-blue	8 (53.33)	2(100)	1(14.28)	0	0	0	1(100)
Bluish-black	0	0	2(28.57)	1 (25)	8(80)	2(100)	0
Yellowish	0	0	0	1 (25)	0	0	0
Follicular keratotic plugs	0	0	0	0	0	2 (100)	0
Perifollicular scales	0	0	0	0	0	1 (50)	0
Decreased hair density	0	0	0	0	0	2 (100)	0

Table 3: Showing dermoscopic findings in various lichenoid dermatoses

Histopathological Findings

Histopathological findings in various lichenoid dermatoses are shown in Table 4.

Histopathological finding	CLP (n=15) (n%)	ALP (n=2) (n%)	LPP (n=7) (n%)	AD (n=4) (n%)	LPH (n=10) (n%)	LPPil (n=2) (n%)	LSC (n=1) (n%)
Hyperkeratosis							
Laminated	13 (86.67)	2 (100)	3 (42.86)	1 (25)	10 (100)	1 (50)	1 (100)
Compact	1(6.67)	0	0	0	1 (10)	1 (50)	0
Parakeratosis	1(6.67)	0	0	0	0	1 (50)	1(100)
Hypergranulosis	11(73.33)	1 (50)	0	0	7 (70)	1 (50)	0
Acanthosis	14(93.33)	2 (100)	2(28.57)	1 (25)	10(100)	2 (100)	1(100)
Spongiosis	4 (26.67)	1 (50)	0	1 (25)	1 (10)	0	0
Necrosis	0	0	0	0	0	0	0
Bullae	1(6.67)	0	0	0	2 (20)	0	0

Saw-shaped acanthosis	12(80)	0	0	0	6 (60)	1 (50)	0
Sharp borders	12(80)	0	0	0	6 (60)	0	0
Unsharp borders	2(13.33)	2 (100)	2(28.57)	1 (25)	4 (40)	2 (100)	1(100)
Lichenoid infiltrate	14(93.33)	2 (100)	3(42.86)	0	10(100)	1 (50)	0
Vacuolar degeneration at DEJ	15 (100)	1 (50)	6(85.71)	3 (75)	10(100)	1 (50)	0
Infiltrate							
Mild	5 (33.33)	1 (50)	6(85.71)	4 (100)	0	1 (50)	0
moderate	10(66.67)	1 (50)	1(14.28)	0	10(100)	1 (50)	1(100)
Perivascular infiltrate	6 (40)	1 (50)	1(14.28)	2 (50)	4 (40)	1 (50)	1(100)
Diffuse infiltrate	12 (80)	1 (50)	2(28.57)	1 (25)	9 (90)	0	0
Lymphocytes	15 (100)	2 (100)	7 (100)	3 (75)	10(100)	2 (100)	1(100)
Histiocytes	1 (6.67)	0	1(14.28)	0	1 (10)	0	0
Pig. Melanophages	8 (53.33)	1 (50)	7 (100)	3 (75)	8 (80)	2 (100)	1(100)

Table 4: showing histopathological findings in various lichenoid dermatoses.

Correlation of dermoscopic and histopathological findings

As shown in (Table 5), in Classical Lichen Planus (CLP) and Actinic Lichen Planus (ALP) patients, white structures seen on dermoscopy (Figure 1) appeared to correspond histologically to laminated hyperkeratosis (Figure 2).

Dermoscopic Finding	**Histopathological Finding**		**Measure of Agreement**	
			Kappa (SE)	**P value**
White structures	**Laminated Hyperkeratosis**		-0.133 (0.066)	0.582NS
	Absent	Present		
Absent	-	2		
Present	2	13		
Greyish-blue pigmentation	**Pigmented Melanophages**		0.056 (0.242)	0.819NS
	Absent	Present		
Absent	4	4		
Present	4	5		
Grey-blue dots	**Pigmented melanophages**		-0.013 (0.150)	0.929NS
	Absent	Present		
Absent	7	8		
Present	1	1		

Table 5: showing correlation of dermoscopic and histopathological findings in classical lichen planus (CLP) and actinic lichen planus (n=17). NS: p >0.05; Not Significant; SE : Standard error.

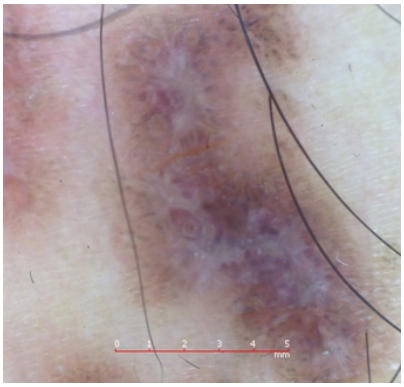

Figure 1: Dermoscopy showing 'starburst pattern' and Micro-Koebner's phenomenon in Lichen Planus.

Various patterns of pigmentation and pigmented dots represented melanophages in the dermis.

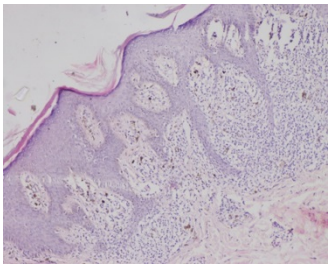

Figure 2: Photomicrograph showing saw-tooth shaped acanthosis in Lichen Planus (H&E, 200x)

As shown in (Table 6), in Lichen planus pigmentosus (LPP) and Ashy dermatosis (AD) patients, nonvascular findings were the prominent feature on dermoscopy (Figure 3) which consisted of mainly pigmentation varying from yellowish brown to black, and brownish to grey-blue dots which appeared to correspond to melanophages in the dermis. (Figure 4).

Dermoscopic Finding	**Histopathological Finding**		**Measure of agreement**	
			Kappa (SE)	**P value**
Greyish-blue dots	**Pigmented melanophages**		0.020 (0.028)	0.740NS
	Absent	Present		
Absent	1	9		
Present	0	1		
Greyish-blue pigmentation	Pigmented melanophages		0.020 (0.028)	0.740NS
	Absent	Present		
Absent	1	9		
Present	0	1		
Bluish-black pigmentation	**Pigmented melanophages**		0.072 (0.079)	0.521NS
	Absent	Present		
Absent	1	9		
Present	0	1		

Table 6: Showing correlation between dermoscopic and histopathological findings in lichen planus pigmentosus (LPP) and ashy dermatosis (n=11). NS: p >0.05; Not Significant; SE : Standard error.

In Lichen planopilaris (LPPilaris) patients, perifollicular scales and follicular keratotic plugs appeared to represent the follicular hyperkeratosis. Pigmentation of variable colors corresponded to the dermal melanophages.

In Lichen Simplex Chronicus (LSC) patient, white structures, greyish-blue dots and red dots were observed on dermoscopy. While on histopathological examination, laminated hyperkeratosis, acanthosis with unsharp borders, moderate lymphocytic infiltrate and pigment melanophages in the dermis were present. The white structures appeared to correspond to hyperkeratosis while greyish-blue dots corresponded to dermal melanophages.

Eight patients (16%) were having non-specific changes on histopathological examination. So, these could not be categorized. Out of these eight patients, two patients had clinical picture suggestive of lichen planus which was further supported by the dermoscopic findings, but the histopathological findings were found to be non-specific. One patient had clinical picture of lichenoid drug eruption, supported by dermoscopic features, which was found to be subsided over a period of few weeks after stoppage of the causative drug, but histopathological findings were not consistent with the clinical diagnosis. Similarly, one patient with HIV infection had clinical picture along with dermoscopic features suggestive of lichen planus but histopathology found only non-specific changes.

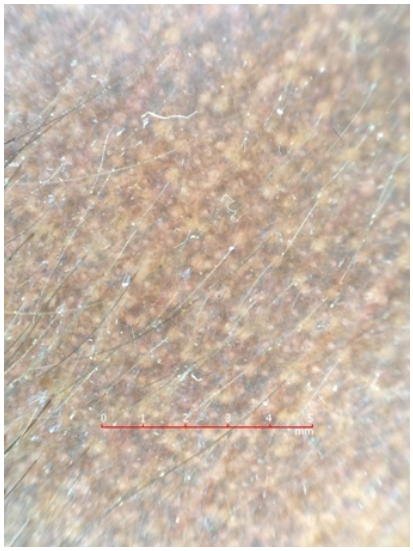

Figure 3: Dermoscopy showing pigmentation and globules in Lichen Planus Pigmentosus.

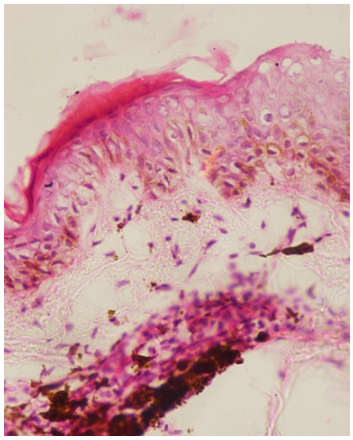

Figure 4: Photomicrograph showing pigment incontinence in Lichen Planus Pigmentosus (H&E, 400x).

In Lichen planus hypertrophicus (LPH) patients (Table 7), white structures, corn pearls and comedo-like openings (Figure 5) appeared to represent hyperkeratosis and hypergranulosis. Pigmentation of variable colors corresponded to melanophages in the dermis.

Dermoscopic Finding	Histopathological Finding	P value
White structures (9/10)	Laminated Hyperkeratosis (10/10)	0.305NS
Bluish-black pigmentation (8/10)	Pigmented melanophages (8/10)	1.00NS

Table 7: Showing correlation between dermoscopic and histopathological findings in lichen planus hypertrophicus (LPH) (n=10). NS: p >0.05; Not Significant.

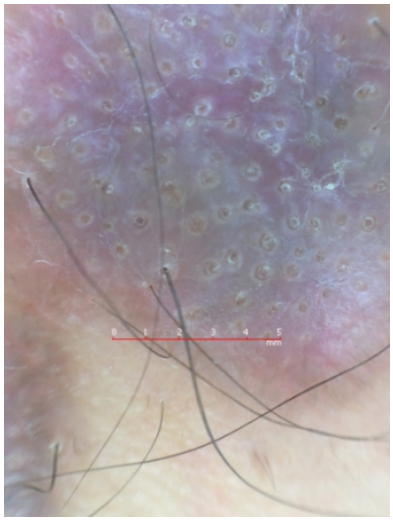

Figure 5: Dermoscopy showing multiple comedo-like openings filled with yellow keratotic plugs in Lichen Planus Hypertrophicus.

Two patients were found to have only finding of overactivity of melanocytes on histopathology. One patient had histopathological findings of psoriasiform hyperplasia and other non-specific changes despite the clinical picture of lichenoid disorder. One patient had cicatricial alopecia possibly due to lichen planopilaris, the diagnosis of which was further suggested by dermoscopic findings, but histopathology did not support the diagnosis.

Discussion

Till date, role of dermoscopy was mainly emphasized to detect melanoma but recently its role in other dermatoses is also being explored [4].

Histopathological examination is considered the gold standard for diagnosis in dermatology, but biopsy is usually avoided over cosmetically important areas including face and also in pediatric patients. Thus, dermoscopy can help us to reduce the number of unnecessary invasive interventions [4].

Anti-HCV antibodies were found only in 1 (2%) out of 50 patients which was at variance with other studies conducted by R Gimenez-Garcia et al. [5] and J. Sánchez-Pérez et al [6] who found anti-HCV antibodies in 8.9% and 20% of patients respectively. This variation could be due to exclusion of mucosal lesions in our study.

In this study of fifty patients, 15 patients (30%) were diagnosed with CLP followed by 10 patients (20%) with LPH, ALP in 2 patients (4%) and LPPilaris in 2 patients (4%). This order of frequency among the morphological variants of lichen planus is in relation with Bhattacharya et al [7], OP Singh et al [8] and Salah A Abdallat et al [9], but is in contrast with Tag-El-Din Anbar et al [10]. Other 13 patients comprised of LPP (7 patients, 14%), AD (4 patients, 8%), LSC (1 patient, 2%) and polymorphic light eruption (1 patient, 2%). Nonvascular patterns were the predominant feature in various lichenoid dermatoses in our study.

In CLP patients, a particular pattern was observed consisting of white structures with linear streaks arranged in a radial manner

(starburst pattern). Other dermoscopic findings in CLP patients included brownish dots, grey-blue dots, corn pearls, comedo-like openings, milium-like cysts and pigmentation varying from brown to greyish-blue. These findings were consistent with Shekhar S Haldar et al [11] and F. Vazquez-Lopez et al [12]. In ALP patients also, similar findings were observed on dermoscopy like white structures, white globules and pigmentation varying from brown to geyish-blue. In LPP patients, we observed brownish dots, white globules and pigmentation varying from brown to bluish-black with or without retaining of normal skin markings similar to those mentioned Shekhar S Haldar et al [11] and Sule Gungor et al [13].

In AD patients, we found brownish dots, grey-blue dots and pigmentation varying from yellowish to bluish-black. These findings were consistent with F. Vazquez-Lopez et al. [14] and Jose M. Martin et al. [15].

Dermoscopic findings observed in LPH patients included white structures (9/10, 90%), bluish-black pigmentation (8/10, 80%), comedo-like openings (5/10, 50%), corn pearls (2/10, 20%), brown pigmentation (2/10, 20%), red dots (2/10, 20%) and red globules (1/10, 10%). So, these findings were in relation with Sunanda A Mahajan [16], Shekhar S Haldar et al [11] and Ankad BS et al [17].

In LPPilaris, follicular keratotic plugs, perifollicular scales, white structures and pigmentation varying from brown to bluish-black were observed on dermoscopy which were similar to those observed by Viral Thakkar et al [18] and Shekhar S Haldar et al. [11].

In the only patient of LSC, white structures, greyish-blue pigmentation and red dots were found.

Most of the characteristic histopathologic features of LP were encountered with regularity. Most frequently observed findings were laminated hyperkeratosis, hypergranulosis, acanthosis, saw-tooth elongation of rete ridges, vacuolar degeneration at DEJ, a band-like lymphocytic infiltrate in the upper dermis and pigment melanophages. Less frequent findings were spongiosis, acanthosis with unsharp borders and histiocytic infiltrate. These findings were in concordance with study done by Asmita Parihar et al. [19].

Although the individual dermoscopic findings in various lichenoid dermatoses have been described in literature, but there is a paucity of literature describing the correlation of dermoscopic with their histopathological findings.

Shekhar S Haldar et al [11] suggested that in lichen planus, the pearly white structures seen on dermoscopy corresponded histologically to a compact orthokeratosis above the zones of wedge-shaped hypergranulosis centered around acrosyringia and acrotrichia. Gray-blue dots or brown punctate areas represent melanophages in dermis. In CLP and ALP patients, the findings were consistent with above mentioned observations.

Shekhar S Haldar et al [11] also described histopathological correlation of various dermoscopic features observed in LPP and AD in which they suggested that pigment granules on dermoscopy probably correlated with clusters of melanophages in papillary dermis and around acrosyringial and follicular openings. In present study, similar observations were found in few of LPP and AD patients otherwise the findings were at variance.

In LPH patients, white structures, corn pearls and comedo-like openings appear to represent hyperkeratosis and hypergranulosis, while pigmentation of variable colors may be due to presence of melanophages in the dermis. Sunanda A Mahajan [16] related the comedo-like openings with the hyperplastic, dilated, hypergranulotic infundibula with hyperkeratosis; corn pearls with the transepidermal elimination; gray-blue dots with melanophages in dermis and milium-like cysts with intraepidermal keratin. Similar correlation has been described by Shekhar S Haldar et al [11] and Ankad BS et al. [17]. The findings were somewhat in relation with the previous findings.

Among the LPPilaris patients, perifollicular scales and follicular keratotic plugs appeared to represent the follicular hyperkeratosis while pigmentation of variable colors corresponded to the dermal melanophages. Viral Thakkar et al. [18] and Shekhar S Haldar et al. [11] described similar histopathological correlationin their studies.

Conclusion

Dermoscopy can prove to be a novel diagnostic modality for various vascular, inflammatory and infectious diseases. But cost is still a limiting factor. To the best of our knowledge, this was one of the initial studies correlating the dermoscopic and histopathological findings in lichenoid dermatoses. Though the number of cases in our study was too small to reach a conclusion, but by looking at observations of our study, we suggest that dermoscopy can be a valuable tool to diagnose lichenoid dermatoses in conditions where histopathological examination is not possible. It is recommended that large series of observations are required for individual disorders to identify the constellation of features for that particular condition.

References

1. Inamadar AC, Palit A (2008) Lichen Planus and Lichenoid Disorders. In IADVL Textbook of Dermatology, R. G. Valia and A. R. Valia (eds). (3rdedn), Bhalani Publishing House, Mumbai, pp. 1070-86.
2. Nischal KC, Khopkar U (2005) Dermoscope. Indian J Dermatol Venereol Leprol 71: 300-303.
3. Stolz W, Bilek P, Landchaer M, Amandcogneta (1994) Basis of dermatoscopy and skin-surface microscopy. In Color atlas of dermatoscopy, W. Stolz, P. Bilek, M. Landchaer, Amandcogneta. (1st edn), Blackwell Publications, Germany, pp.7-10.
4. Lallas A, Argenziano G (2014) Dermatoscope-the dermatologist's stethoscope. Indian J Dermatol Venereol Leprol 80: 493-494.
5. Gimenez-Garcia R, Perez-Castrillon (2003) Lichen planus and hepatitis C virus infection. J Eur Acad Dermatol Venereol 17: 291-295.
6. Sánchez-Pérez J, De Castro M, Buezo GF, Fernandez Herrera J, Borque MJ, et al (1996) Lichen planus and hepatitis C virus: prevalence and clinical presentation of patients with lichen planus and hepatitis C virus infection. Br J Dermatol 134: 715-719.
7. Bhattacharya M, Kaur I, Kumar B (2000) Lichen planus: a clinical and epidemiological study. J Dermatol 27: 576-582.
8. Singh OP, Kanwar AJ (1976) Lichen planus in India: an appraisal of 441 cases. Int J Dermatol 15: 752-756.
9. Abdallat SA, Maaita TJ (2007) Epidemiological and clinical features of lichen planus in Jordanian patients. Pak J Med Sci 23: 92-94.
10. Anbar T, Barakat M, Ghannam SF (2005) A clinical and epidemiological study of lichen planus among Egyptians of AL-Minya province. Dermatol online J 11: 4.
11. Haldar SS, Khopkar U (2013) Dermoscopy of lichen planus. In LICHEN PLANUS, U. Khopkar, A. Valia (eds). (1stedn), Jaypee, New Delhi, pp. 148-62.
12. Lopez FV, Manjon-Haces JA, Maldonado-Seral C, Raya-Aguado C, Perez-Oliva N (2003) Dermoscopic Features of Plaque Psoriasis and Lichen Planus: New Observations. Dermatology 207: 151-156.

13. Güngör Ş, Topal IO, Erdoğan Ş, Erdogan S, Ozcan D (2014) Classical lichen planus and lichen planus pigmentosus inversus overlap with dermoscopic features. Our Dermatol Online 5: 42-44.
14. Lopez FV, Vidal AM, Zalaudek I (2010) Dermoscopic Subpatterns of Ashy Dermatosis Related to Lichen Planus. Arch Dermatol 146: 110.
15. Martin JM, Lopez V, Jorda E, Monteagudo C (2008) Ashy Dermatosis With Significant Perivascular and Subepidermal Fibrosis. Am J Dermatopathol 30: 512-514.
16. Mahajan SA (2012) Dermoscopy of Lichen Planus. In Dermoscopy and Trichoscopy in Diseases of the Brown Skin, U. Khopkar, editor. (1stedn), Jaypee, New Delhi, pp.114-36.
17. Ankad BS, Beergouder SL, Sujana L (2014) Dermoscopy of Hypertrophic Lichen Planus. Austin Journal of Dermatology 1: 2.
18. Thakkar V, Haldar SS (2012) Trichoscopy of Patchy Alopecia. In Dermoscopy and Trichoscopy in Diseases of the Brown Skin, U. Khopkar, editor. (1stedn), Jaypee, New Delhi, pp.182-201.
19. Parihar A, Bhattacharya SN, Singh UR (2014) A clinicopathological study of cutaneous lichen planus. Journal of Dermatology & Dermatologic Surgery.