

Clinical, Dermoscopic and Histopathological Characteristics of Lichen Planus: A Cross-sectional Study

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ABSTRACT

Introduction: Lichen Planus (LP) is a common papulosquamous disorder encountered in Dermatology Outpatient Departments. It exhibits characteristic dermoscopic and histopathological features. Dermoscopy serves as a non invasive bridge between clinical diagnosis and histopathological confirmation.

Aim: To describe the dermoscopic, clinical and histopathological features of LP and its variants.

Materials and Methods: This cross-sectional study was conducted at the Department of Dermatology, Venereology and Leprosy at Chirayu Medical College and Hospital, Bhopal, Madhya Pradesh, India, from December 2023 to May 2025. Adult patients (>18 years) with clinically diagnosed LP were included in the study. A detailed history and clinical examination was done, and findings were recorded in predesigned proforma. This was followed by dermoscopy and histopathological examination, and findings were noted. The data was analysed using descriptive statistics, including frequency, percentage, mean, and standard deviation.

Results: A total of 100 patients were enrolled, out of which 43 were males, and 57 females with a ratio of 1:1.3. Majority patients (n=56) were in age group 18-40 years 56 (56%). The duration of disease commonly seen was between three to six months 37 (37%). The most common site of involvement was the lower limbs, seen in 72 (72%) patients. The most common variant of LP seen was classical LP 65 (65%) followed by hypertrophic LP 12 (12%) and LP pigmentosus 7 (7%). On dermoscopic examination, Wickham's striae was the most specific and sensitive finding found in 75 (75%) patients with reticular 25 (25%) being the most common morphological pattern. On histopathology, basal cell degeneration with band-like infiltrate was found as most frequent finding 92 (92%) while wedge-shaped hypergranulosis 75 (75%) was most specific finding.

Conclusion: Dermoscopic findings are specific for LP and, many times, can replace histopathology for diagnosis of the condition.

Keywords: Dermoscopy, Histopathology, Lichenoid reaction, Wickham's striae

INTRODUCTION

Lichen planus (LP) is a common papulosquamous disorder seen in Dermatology Outpatient Departments (OPD). It has peculiar dermoscopic and histopathological features. Dermoscopy can act as a bridge between clinical diagnosis and histopathological confirmation of the condition. Dermoscopy recognises even the subtle morphological changes in LP [1]. Dermoscopy can be used to study different stages of LP and, therefore, can be used to monitor the efficacy of the therapy [1]. LP is an idiopathic, chronic, inflammatory disease that affects the skin, mucous membranes and appendages. The prevalence of LP varies from 0.1-4% [2]. The term LP has been derived from the Greek word leichen, meaning tree moss, and the Latin word planus, meaning flat [3]. It presents with extremely pruritic, flat-topped polygonal, violaceous papules and plaques. The aetiology of LP is largely unknown. The current trend is to consider LP as an autoimmune disease. LP has been frequently associated with various autoimmune disorders like ulcerative colitis, myasthenia gravis, lupus erythematosus, alopecia areata, and diabetes mellitus. Also, viral infections, vaccinations, systemic drugs, and dental restorative material like amalgam can also induce lesions of LP [2]. LP has peculiar dermoscopic and histopathological findings showing white radiating lines called Wickham's striae on dermoscopy and lichenoid reaction i.e., basal cell vacuolar degeneration with band-like infiltrate at the dermoepidermal junction on histopathology.

As histopathology is an invasive procedure, many times it is difficult to perform the procedure in each and every patient. Dermoscopy, being a non invasive procedure and having characteristic features of LP, can help replace histopathology in difficult situations. Hence, the present study aimed to describe the dermoscopic, clinical and histopathological features of different stages and variants of LP.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Department of Dermatology, Venereology and Leprosy at Chirayu Medical College and Hospital, Bhopal, Madhya Pradesh, India, from December 2023 to May 2025, after obtaining approval from the Institutional Ethics Committee (CMCH/EC/2023/80).

Inclusion criteria: Patients aged of >18 years having lesions of LP who were willing to give written informed consent, were included in the study.

Exclusion criteria: Patients already on treatment, active infection around the lesions, pregnant/lactating mothers, history of allergic reaction to lignocaine, bleeding diathesis and patients on anticoagulants and cardiac illness were excluded from the study.

Study Procedure

After obtaining written informed consent, all eligible patients underwent a detailed history and clinical examination, including mucosal, scalp and nail examination. Different stages of classical LP were identified clinically as:

- Early- Initial erythematous flat-topped papules;
- Active- Classic violaceous polygonal papules with prominent Wickham's striae;
- Resolving- Lesions flattened with diminishing erythema and fading Wickham's striae;
- Resolved- Post inflammatory hyperpigmentation (Grey brown macules) without inflammation or epidermal proliferation.

Demographic details, onset, duration distribution of lesions, etc., were documented in predesigned proforma. Some basic

investigations like thyroid profile, sugar profile, Liver Function test (LFT) etc., were done as and when required. This was followed by Dino-lite Premier Digital Microscope (AM4113ZT) with polarised light and the following findings were captured using the Dinocapture 2.0 software in a Lenovo IdeaPad 310 Laptop.

- a. Wickham's Striae
 - **Reticular:** net-like white lines
 - **Radial streaming:** white lines radiating outward from a central point
 - **Linear:** straight white streaks
 - **Leaf venation:** branching lines resembling leaf veins
 - **Veil-like:** diffuse white haze over the lesion
 - **Starry sky:** scattered white dots on a dark background
 - **Globular:** rounded white structures
 - **Perpendicular:** vertical white streaks
 - **Annular:** ring-shaped white structures
- b. Vascular patterns were categorised as dotted, linear, or hairpin.
- c. Background colours were recorded as red, violaceous, or brown, depending on the stage of inflammation.
- d. Pigmentation types included dots and globules, homogenous, peppering, and hem-like patterns.
- e. Special structures like scaling, bouquet of white roses, Comedo-like structures, Perifollicular cast and white dots

Then all patients underwent skin biopsy and samples were sent to Department of Pathology for histopathological examination. Photographs were taken with the patient's consent, ensuring that their identity would not be revealed and confidentiality would be maintained at all levels.

STATISTICAL ANALYSIS

The recorded data were compiled and entered into a spreadsheet (Microsoft Excel). The results were tabulated and described in terms of distribution, frequency and Mean±SD.

RESULTS

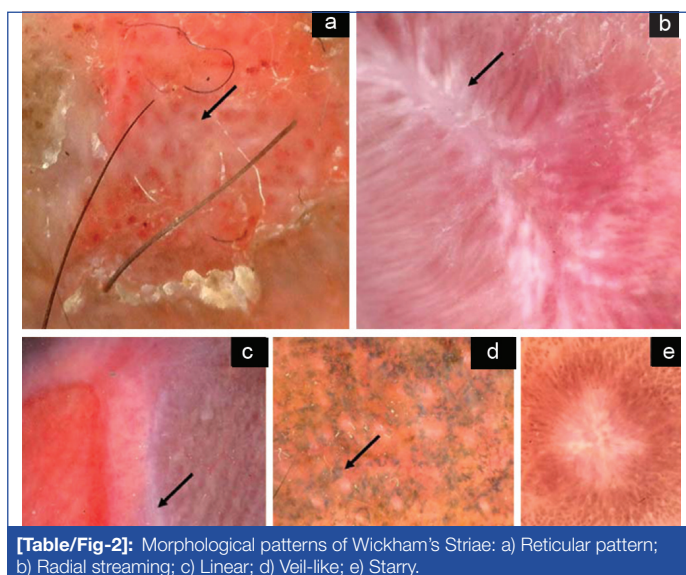
A total of 100 patients were enrolled, out of which 43 (43%) were males, and 57 (57%) were females. The majority of patients 56 (56%) were in the age group 18-40 years, with a mean age of 37.2 years. Common co-morbidities included hypertension 18 (18%) and Diabetes Mellitus 15 (15%). The duration of disease commonly seen was between three to six months in 37 (37%) cases. Itching was the prominent symptom seen in 81 (81%) patients. The most common site of involvement was lower limbs, seen in 72 (72%) patients. The most common variant of LP seen was classical LP 65 (65%). Nail involvement was seen in 7 (7%) patients. Koebner phenomenon was seen in 13 (13%) patients. Demographic details are shown in [Table/Fig-1].

Variables	n (%)
Gender	
Males	43 (43%)
Females	57 (57%)
Age	
18-40 years	56 (56%)
41-60 years	28 (28%)
>60 years	16 (16%)
Duration	
<3 months	23 (23%)
3-6 months	37 (37%)
6-12 months	29 (29%)
>12 months	11 (11%)

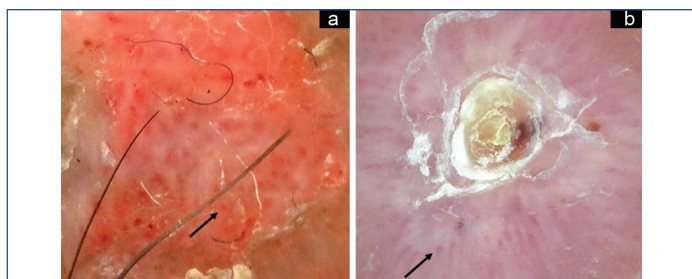
Associated co-morbidities and precipitating factors	
Hypertension	18 (18%)
Diabetes mellitus	15 (15%)
Thyroid	7 (7%)
Other autoimmune disorders	3 (3%)
Hepatitis B Infection	1 (1%)
History of vaccination	1 (1%)
Drug intake	2 (2%)
Dental Procedure	3 (3%)
Site	
Upper limbs	58 (58%)
Lower limbs	72 (72%)
Trunk	12 (12%)
Face and neck	6 (6%)
Scalp	5 (5%)
Mucosa	5 (5%)
Nails	7 (7%)
Variants	
Classical LP	65 (65%)
Hypertrophic Lichen Planus (LP)	12 (12%)
Lichen Planus (LP) Pigmentosus	7 (7%)
Lichen plano pilaris	5 (5%)
Mucosal LP	5 (5%)
Acute eruptive LP	2 (2%)
Linear LP	1 (1%)
Annular LP	1 (1%)
Zosteriform LP	1 (1%)
Actinic LP	1 (1%)

[Table/Fig-1]: Demographic profile.

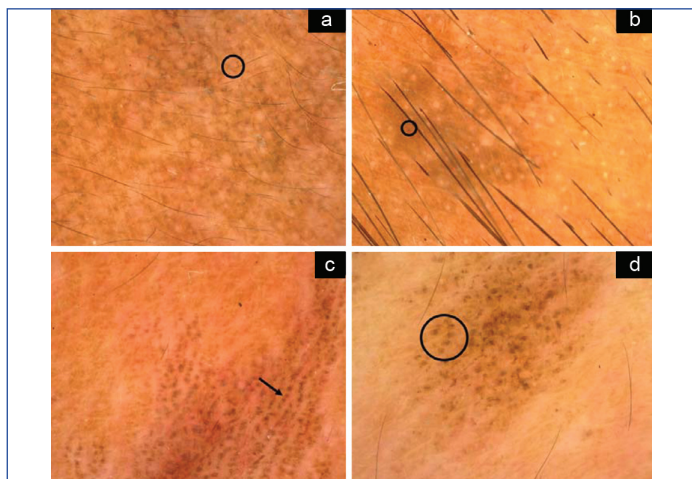
On dermoscopic examination, Wickham's striae are considered to be a highly specific and sensitive marker of LP, which was seen in 75 (75%) patients. The most common morphological pattern of Wickham's Striae seen was reticular 25 (25%), followed by radial streaming 19 (19%) and linear pattern 13 (13%) [Table/Fig-2]. Wickham's Striae was surrounded by vascular patterns in 46(46%) patients which were in dotted 37 (37%), linear 7 (7%) and hairpin pattern 2 (2%) [Table/Fig-3]. Pigmentation was seen in 66 (66%) patients which were seen in form of dots and globules 43 (43%), homogenous 20 (20%), hem-like 2 (2%) and peppering 1 (1%) [Table/Fig-4]. Bouquet of white roses and Comedo-like structures were seen in hypertrophic LP in 7 (7%) and 5 (5%) cases respectively [Table/Fig-5]. Perifollicular casts and fibrotic white dots were seen in



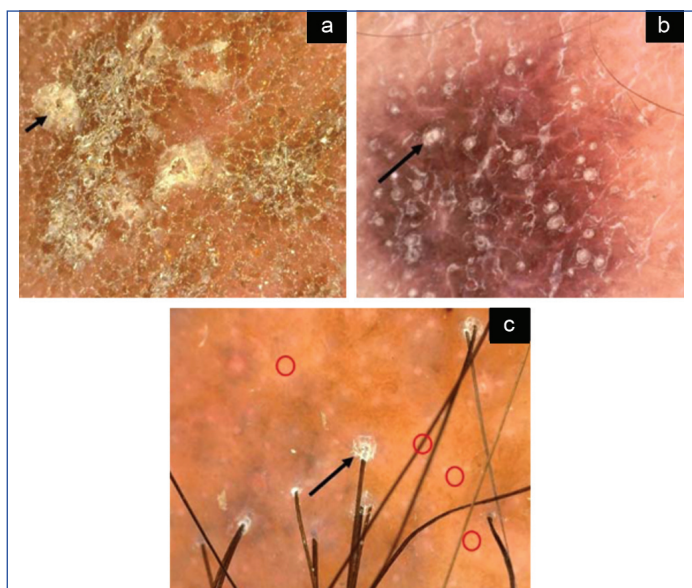
[Table/Fig-2]: Morphological patterns of Wickham's Striae: a) Reticular pattern; b) Radial streaming; c) Linear; d) Veil-like; e) Starry.



[Table/Fig-3]: Vascular patterns: a) dotted; b) Linear pattern.



[Table/Fig-4]: Various types of pigmentation: a) Dots and globules (black circle); b) Homogenous (black circle); c) Hem-like black arrow; d) Peppering (black circle).



[Table/Fig-5]: a) Bouquet of white roses with rippled surface in Hypertrophic LP; b) Comedo-like structures in Hypertrophic LP; c) Perifollicular casts and scaling (black arrow) and fibrotic white dots (red circles) in Lichen planopilaris.

Lichen planopilaris in 4 (4%) and 3 (3%) patients, respectively [Table/Fig-5,6]. In classical LP 65 (65%), 10 (10%) patients had lesions in early phase, 33 (33%) in active phase, 17 (17%) in resolving phase and 5 (5%) in resolved phase [Table/Fig-7,8].

On histopathology, basal cell degeneration with band-like infiltrate was found as the most frequent finding in 92 (92%), while wedge-shaped hypergranulosis was the most specific finding in 75 (75%) patients. Other findings were hyperkeratosis 72 (72%), irregular acanthosis 76 (76%), saw tooth appearance of rete ridges 51 (51%), Max Joseph space 7 (7%), pigment incontinence 66 (66%) and Civatte bodies 44 (44%).

DISCUSSION

In the present study, the most common age group affected was 18-40 years, 56 (56%), which was consistent with findings of most studies [4-6] except few studies like Gavvala M and Gavvala M who reported 41-60 years as the most common age group affected [7]. Females were more commonly affected than males, which is similar to findings of Malhotra A et al., and Parihar A et al., [5,8] while Horatti LB et al., and Wankhade S et al., [6,9] showed increased male preponderance. The maximum patients had disease duration of 3-6 months, 37 (37%), which was consistent with Horatti LB et al., [6].

Hypertrophic LP and LP pigmentosus had shown even longer duration of illness of 6-12 months, similar to findings of Wankhade S et al., [9]. Lower limb was most common site of involvement, which is consistent with Parihar A et al., [8] while other studies reported the upper limb as the most common site of involvement [4,6,7]. Most common variant of LP was found to be classical LP, followed by hypertrophic LP and LP pigmentosus, which was similar to findings of Wankhade S et al., [9], while Gavvala M and Gavvala M [7] and Malhotra A et al., [5] had shown eruptive LP as the second and third most common variant of LP, respectively. Nail findings were present in 7 (7%) patients, while Horatti LB et al., [6] found nail involvement in 5.4% cases. Koebner phenomenon was seen in 13 (13%) cases, while Malhotra A et al., [5] reported it in 52% patients.

On dermoscopy, Wickham's striae were found in 75 (75%) patients, while Gavvala M and Gavvala M [7] and Horatti LB et al., [6] reported it in 97.43% (38 out of 39) and 93.1% (68 out of 73) of their respective cohorts. In classical LP, Wickham's striae were seen in 56 (56%) patients, whereas Makhecha M et al., and Malhotra A et al., reported it in 81.08% and 88.5% respectively [1,5]. Wickham's striae were absent in LP pigmentosus as noted by Horatti LB et al., [6] and Malhotra A et al., [5]. The present study also reported the absence of Wickham's striae in LP pigmentosus, except in one case where a veil-like structure was found. Along with LP pigmentosus, Wickham's striae was absent in Lichen planopilaris, Linear LP and zosteriform LP. Most common pattern found was reticular 25 (25%) followed by radial streaming 19 (19%) and linear 13 (13%) which was consistent with findings of Makhecha M et al., [1] and Gavvala M and Gavvala M [7] while Horatti et al., [6] reported leaf venation

Variables	Cla (65)	HLP (12)	LPPi (7)	LPP (5)	Muc (5)	AELP (2)	Li (1)	Ann (1)	Zos (1)	Act (1)
Wickham's Striae (75)	56	9	1	0	5	2	0	1	0	1
Reticular (25)	19	4	0	0	2	0	0	0	0	0
Radial Streaming (19)	14	2	0	0	2	1	0	0	0	0
Linear (13)	12	0	0	0	1	0	0	0	0	0
Leaf venation (5)	5	0	0	0	0	0	0	0	0	0
Veil-like (5)	3	1	1	0	0	0	0	0	0	0
Starry Sky (3)	1	1	0	0	0	1	0	0	0	0
Round/Annular (2)	0	0	0	0	0	0	0	1	0	1
Globular (2)	1	1	0	0	0	0	0	0	0	0
Perpendicular (1)	1	0	0	0	0	0	0	0	0	0
Vascular Pattern (46)	25	12	0	0	5	2	0	1	0	1
Dotted (37)	19	12	0	0	2	2	0	1	0	1

Linear (7)	5	0	0	0	2	0	0	0	0	0
Hairpin (2)	1	0	0	0	1	0	0	0	0	0
Background (100)	65	12	7	5	5	2	1	1	1	1
Red (17)	10	2	0	0	4	1	0	0	0	0
Violaceous (58)	39	6	5	4	1	1	0	1	0	1
Brown (25)	16	4	2	1	0	0	1	0	1	0
Pigmentation (66)	32	12	7	5	5	1	1	1	1	1
Dots and Globules (43)	17	7	5	5	5	1	1	1	0	1
Peppering (1)	0	0	0	0	0	0	0	0	1	0
Homogenous (20)	15	5	0	0	0	0	0	0	0	0
Hem-like (2)	0	0	2	0	0	0	0	0	0	0
Special features										
Scaling (39)	27	5	0	4	0	1	0	1	0	1
Bouquet of white roses (7)	0	7	0	0	0	0	0	0	0	0
Comedo-like structures (5)	0	5	0	0	0	0	0	0	0	0
Perifollicular cast (4)	0	0	0	4	0	0	0	0	0	0
White dots (3)	0	0	0	3	0	0	0	0	0	0

[Table/Fig-6]: Dermoscopy of various variants of Lichen Planus (LP).

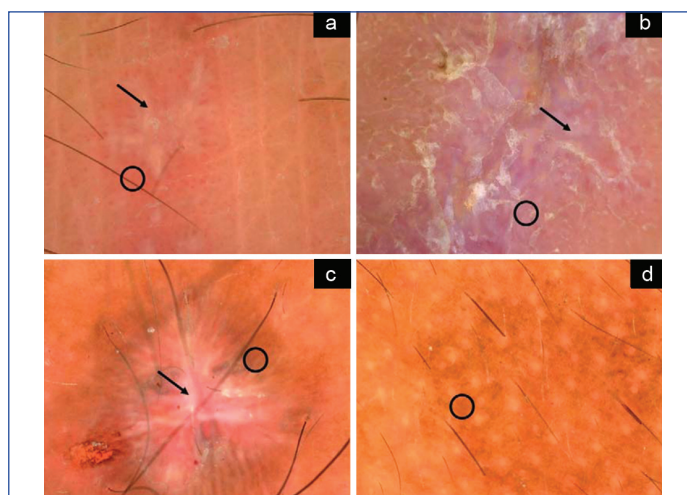
Cl: Classical LP; HLP: Hypertrophic LP; LPPI: Lichen Planus Pigmentosus; LPP: Lichen planopilaris; Muc: Mucosal LP; AELP: Acute eruptive LP; Li: Linear LP; Ann: Annular LP; Zos: Zosteriform LP; Act: Actinic LP

Classical LP (65)	Early (10)	Active (33)	Resolving (17)	Resolved (5)
Wickham's Striae (56)	10	33	13	0
Reticular (19)	4	9	6	0
Radial Streaming (14)	3	7	4	0
Linear (12)	2	7	3	0
Leaf venation (5)	0	5	0	0
Veil-like (3)	0	3	0	0
Round/Circular/Annular (0)	0	0	0	0
Perpendicular (1)	1	0	0	0
Starry Sky (1)	0	1	0	0
Globular (1)	0	1	0	0
Vascular Pattern (25)	10	15	0	0
Dotted (19)	7	12	0	0
Linear (5)	2	3	0	0
Hairpin (1)	1	0	0	0
Background (65)	10	33	17	5
Red (10)	10	0	0	0
Violaceous (34)	0	28	6	0
Brown (21)	0	5	11	5
Pigmentation (32)	0	10	17	5
Dots and globules (17)	0	7	6	4
Homogenous (15)	0	3	11	1

[Table/Fig-7]: Dermoscopy of various stages of Classical Lichen Planus (LP).

as most common pattern and Nandini AS and Zacharias M [4] and Malhotra A et al., [5] reported circular and veil-like as second most common morphological patterns, respectively.

Vascular pattern was seen in 46 (46%) patients, among which the dotted pattern 37 (37%) was most common, followed by the linear pattern 7 (7%). Nandini AS and Zacharias M [4] and Gavvala M and Gavvala M [7] found vascular patterns in 20% and 66.6% cases, respectively, predominantly of the dotted type, while Horatti LB et al., [6] reported vascular patterns in all cases. In classical LP, vascular pattern was seen in 25 (25%) patients, while Makhecha M et al., [1] and Malhotra A et al., [5] reported in 37.8% and 69.2%, respectively. In mucosal LP, a vascular pattern was present in all cases, while Rouai M et al., [10] reported in 88%. Vascular pattern was found absent in LP pigmentosus, Lichen palnopilaris, linear LP and Zosteriform LP. Chamli A et al., [11] reported erythema



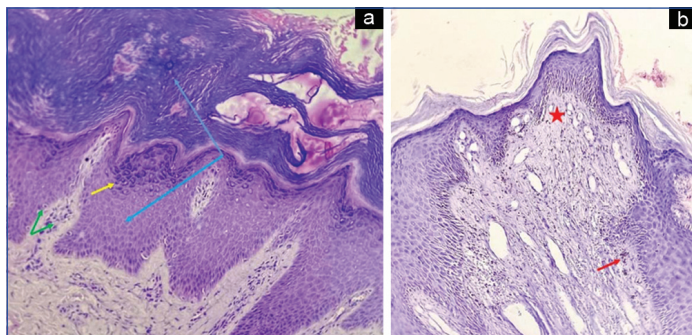
[Table/Fig-8]: Classical LP: a) Early lesion showing red background with dotted vessels (black circle) and newly formed Wickham's striae (black arrow); b) Active lesion showing violaceous background (black circle) with prominent white streaks of Wickham's striae (black arrow); c) Resolving lesion showing reduction of Wickham's Striae (black arrow) and increase in brown background corresponding to melanophages secondary to melanin incontinence (black circle); d) Resolved lesion with diffuse brown background (black circle) with absence of Wickham's Striae.

(17.3%) and telangiectasia (30.4%) among 23 patients of LP pigmentosus.

Background showed violaceous hue as the most common colour in 58(58%) patients, followed by brown in 25 (25%) and red in 17 (17%) patients. Nandini AS and Zacharias M [4] reported a violaceous hue in 80% while Gavvala M and Gavvala M [7] showed dull red 25.64% as the most common background colour.

In histopathology, epidermal changes included hyperkeratosis 72 (72%), wedge shaped hypergranulosis 75 (75%) and irregular acanthosis 76 (76%), while Parihar A et al., [8] and Wankhade S et al., [9] reported wedge-shaped hypergranulosis in 96.5% and 65.8% cases, respectively. Basal cell degeneration with band-like dense infiltrate was seen in 92 (92%), while Parihar A et al., [8] and Wankhade S et al., [9] reported in 94% and 98.7% cases, respectively. Pigment incontinence with melanophages was seen in 66 (66%), which was consistent with findings of Wankhade S et al., [9] while Parihar A et al., [8] reported in 99% cases. Other features included saw tooth appearance of rete ridges 51 (51%), Max Joseph space 7 (7%) and Civatte bodies 44 (44%). Reddy PK et al., [12] also reported saw tooth appearance of rete ridges, Max Joseph space and Civatte bodies in fewer cases only as compared to other features of LP.

On histopathology, red early lesions, which correspond to active inflammation, showed basal cell degeneration with dense band-like infiltrate in the upper dermis. Active lesions with predominant Wickham's striae showed wedge-shaped hypergranulosis and irregular acanthosis. In resolving lesions with reduced inflammation, decreased thickness of lesions and increased pigmentation, histopathology showed sparse infiltrate in upper dermis, atrophic epidermis and pigment incontinence with melanophages in dermis [Table/Fig-9].



[Table/Fig-9]: Histopathology of LP: a) Active lesion showing hyperkeratosis, irregular acanthosis (blue arrow) wedge-shaped hypergranulosis (yellow arrow) and basal cell degeneration with band-like infiltrate (green arrow); b) Resolving lesion showing decreased thickness of epidermis with sparse infiltrate (red star) and prominent pigment incontinence (red arrow) (H&E, 10X).

Limitation(s)

The limitation of the study was that classical LP being the most common variant found in the present study, findings were dominated by this single variant, which precluded in-depth analysis of other less common subtypes.

CONCLUSION(S)

Classical LP was the most common clinical variant, with the reticular pattern being the predominant dermoscopic morphology of Wickham's striae.

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