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# Lichen Planus: Health Related Quality of Life, Dermoscopic Features and Clinical Variants in Uganda.

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### ABSTRACT

**Background:** Lichen planus is a chronic, lichenoid inflammatory disorder affecting skin, mucous and appendages that can negatively impact patients' quality of life. The clinical variants and dermoscopic feature vary based on skin type and race. Such an understanding can ease the diagnosis of lichen planus among dark skinned people.

**Aims and Objective:** The goal of this study was to assess the quality of life and to describe the clinical variants and dermoscopic features among adult patients with lichen planus attending a Regional Referral Hospital skin clinic.

**Methods:** A cross-sectional study was conducted from December 2023 to May 2024. A questionnaire was used to collect patients' data, dermoscopy for describing dermoscopic features, a standardized tool (DLQI) to assess the quality of life and data analyzed using Stata version 17.0.

**Results:** We enrolled 52 adult patients, the median age was 34.5 IQR= 25 – 47. There was a significant relationship between itch  $X^2(1, n = 52) = 17.5102, p < .001$ , embarrassment  $X^2(1, n = 52) = 9.5510, p < .002$  with patients' impaired quality of life. More patients had a very large effect on their quality of life (36.54%). The most common variants were classical (50%) and hypertrophic (23.08%). On dermoscopy 104 lesions were examined, and (25.96%) of lesions had a violet, (22.11%) gray, (15.38%) gray-blue and (15.38%) gray-violet background. The pigmentary changes seen were mostly brown (69.23%). Wickham's striae patterns were reticulate (21.15%) and diffuse (14.42%).

**Limitation:** A single study site.

**Conclusions:** lichen planus exerts a very large effect on patient's quality of life. Itchy skin and a feeling of embarrassment significantly affected the quality of life. Classical and hypertrophic were the most common forms of lichen planus. The most lesions had violaceous or a grayish background, and had brown pigments with a reticulate and diffuse wickham's striae patterns. Routine screening of quality of life should be practiced on patients with lichen planus.

**Key words:** Dermoscopy, Clinical variants, Lichen planus, Quality of life, Wickham's striae

## **INTRODUCTION**

Lichen planus (LP) is a chronic idiopathic lichenoid inflammatory disorder affecting the skin, mucous membranes, and appendages <sup>1</sup> with an incidence of 0.22% to 1% in the global adult population <sup>2</sup>. Both sex are equally affected, predominantly between the ages of 30 and 60.<sup>3</sup> Lichen planus presents in various forms depending on location and morphology, including classical, hypertrophic, actinic and other types in cutaneous tissue, and oral or vaginal lesions in mucosal tissue. <sup>4,5</sup> Clinically, LP is characterized by pruritus, flat-topped papules or plaques, violaceous color and polygonal shapes, often occurring on the wrists, forearms, extremities, sun-exposed areas, and trunks. <sup>6,7</sup>

Histological investigation is the gold standard for diagnosis but is invasive. Dermoscopy offers a non-invasive alternative, allowing for quicker assessment by examining features like background color, scales, vascular and non-vascular structures, follicular organization, pigmentary change, and wickham's striae. <sup>8,9</sup>

Lichen planus can significantly impact quality of life due to pruritus, which may cause embarrassment, and post-inflammatory hyperpigmentation leading to stress and anxiety <sup>10,11</sup>. Severe complications include squamous cell carcinoma in 0.5% to 5% of cases with oral-genital involvement, alopecia, and nail disfigurement. <sup>12</sup>

A dearth of information on clinical variants, dermoscopic features, and quality of life impact of lichen planus documented in Uganda renders this study pertinent in attempting to address these gaps.

## **MATERIALS AND METHODS**

## **Study design and site**

The study was a hospital cross-sectional descriptive design, conducted at referral hospital skin clinic in southwest Uganda, which is approximately 260 miles from Kampala, the country's capital. The hospital is an important public teaching hospital.

## **Study population**

Adult patients that attended skin clinic during the study period of December 2023 to May 2024.

## **Target population**

Adult patients with lichen planus that attended skin clinic during the study period.

## **Inclusion criteria**

Adult patients with lichen planus.

## **Sampling Technique**

Consecutive recruitment of study participants who attended the skin clinic and followed the study protocol throughout the study duration.

## **Ethics approval**

Approval was sought from dermatology department, faculty research committee and research ethics committee at MUST with approval number (MUST-2023-1165). Request and approval from the Regional Referral Hospital to carry out the study at the facility was obtained. Full consent was obtained from the participants.

## **Study Procedure and Data collection**

Standardized questionnaires were used to collect patient's characteristics', physical examinations detailing clinical characteristics, lesion distributions, locations, and variants of lichen planus and in cases of doubt, histopathology was done to confirm the diagnosis. A DermLite 3Gen dermoscope with a Nikon D7100 camera attached to it was used to describe dermoscopic features. A dermatological life quality index tool (DLQI)<sup>13</sup> was used to assess quality of life. Affected areas for photography were marked using a photo measuring label (©Delasco) and pictures taken using a Nikon D3100.

## **Management and Analysis of Data**

Data was entered using Microsoft excel and analyzed using Stata software version 17.0. Both descriptive and inferential analysis was done and presented as means, median, frequencies and percentages and recorded in tables and charts.

## **RESULTS**

### **Participants' characteristics**

A total of 52 patients with lichen planus were interviewed and reviewed: 25 males and 27 females, giving a male-to-female ratio of 1:1. The age range of the patients was between 18 and 76 years old, with a median age of 34.5 IQR 25–47. Most 18 (34.62%) fell in the age category of 21–30 years (Figure.1, Table 1)

### **Quality of life**

The quality of life was affected in 49 (94.23%) of participants in this study, with the degree of impairment; having a very large effect in 19 (36.54%) observed most while extremely large effect 5 (9.62%) was seen least (Table 2).

Table 6 illustrates that the most affected domain was symptoms and feelings, with a mean DLQI score of  $3.63 \pm 0.27$ , followed by daily activities ( $1.98 \pm 0.26$ ). The most specific affected symptom (domain) of quality of life was itch 44 (84.62%) and embarrassed 39(75.00%) (Table 3, Figure. 2). A bivariate analysis showed a statistically significant relationship between itch and feeling embarrassed on the quality of life (Table 4).

### **Clinical variants**

In our study we classified LP into; cutaneous 45 (86.54%), mucosal (), scalp 1 (1.92%), and nail () (fig. 3). The most common cutaneous forms were classical 26 (50%) and hypertrophic LP 12 (23.08%), while the most combine form was classical-hypertrophic LP 7 (13.46%) (Table 5, Figure. 4-5).

Mucosal oral reticular 9 (17.31%) was predominant under mucosal type; on the scalp, planopilaris type had 1 (1.92); and on the nail, the most predominant were distal splitting/onycholysis, yellow to brown discoloration, subungual hyperkeratosis, and chromonychia 2 (3.85%) (Table 6, Figure. 6).

Classical-hypertrophic-mucosal oral reticular lichen planus 9 (17.31%) was the most common mixed presentation observed (Figure.7).

### **Dermoscopic features**

One hundred and four lesions were examined whereby the background of most lesions was; violet 27 (25.96%), gray 23 (22.11%), gray-blue 16 (15.38%), gray-violet 16 (15.38%). The pigmentary changes observed were; brown 72 (69.23%), gray 6 (5.77%), black 5 (4.81). Wickham's striae were seen in 82 lesions, the patterns seen most were reticulate 22 (21.15%) and diffuse 15 (14.42%).

Most scales had a white color 19 (18.27%) and a patchy configuration 6 (5.77%). Vascular structures were red dot 7 (6.73%) and had a peripheral arrangement 3 (2.88%). Non-vascular structure was mostly globules 12 (11.54%) (Table 7, Figure. 8-9).

## **DISCUSSION**

### **Quality of life**

Most of our participants 49 (94.23%) experienced some level of impairment of QOL. Some other studies were agreeable to this finding further compounding the global effect of LP on quality of life.<sup>10,14</sup> Most participants had a moderate to very large effect on QOL with symptoms and feelings ( $3.63 \pm 0.27$ ) being the most impacted domain. Lesions of LP are often unsightly and itchy and can lead to stigma, feeling embarrassed, and disruption of daily activities. Itch and embarrassment significantly related to effect on QOL,  $X^2(1, n=52) = 17.51, p=.000$ ,  $X^2(1, n=52) = 9.55, p<.002$ . Participants who had itch were more likely to have a lower quality of life compared to those who did not have. These findings are similar to those from some other parts of Africa and Asia.<sup>26-27</sup>

### **Clinical variants**

We classified the clinical variants of lichen planus based on both location and morphology. The forms were grouped into: cutaneous, mucosal, nail, and scalp lichen planus. Cutaneous lichen planus emerged as the most predominant form, found in 45 (86.54%) of study participants, with less involvement of the mucosa, scalp, and nails. Even though only new lesions were analyzed in our study, findings were relatable to those in other parts of the world that also studied older lesions.<sup>14, 15</sup> Mucosal involvement was mostly oral, 16 (30.78%). This was comparatively higher to findings from Senegal, Nigeria and Pakistan<sup>3,20,21</sup> where population characteristics may be variable. Like in a few other studies, the scalp was least affected 1 (1.92%).<sup>3</sup>

Classical lichen planus at 26 (50%) was the most common morphological variant seen, followed by hypertrophic LP at 12 (24.08%) while zosteriform 1 (1.92%) a less reported form was the least common and unique variant observed in our study. Relatable findings were observed in studies that had a closeness in design and methodology to ours,<sup>1,3,19</sup> while those that differed in design and duration had slight differences in findings<sup>16</sup>. Oral mucosal involvement was predominantly reticular (17.31%). This finding is reported less in Africa but where mucosal patterns have been analyzed it seems to be the most common.<sup>3,18,21</sup> Genital lesions tend to be erythematous and erosive Cassol et al.,<sup>22</sup> but our patients had mostly a papular genital component. Nail involvement occurred in 2 (3.85%) with predominant signs being distal splitting/onycholysis, chromonychia, subungual hyperkeratosis, and yellow to brown discoloration, which were similar to other studies.<sup>23,24</sup>

### **Dermoscopic features{Citation}**

In our study the dermoscopic features assessed were; background, pigmentary changes, wickham's striae, vascular changes, scales and non-vascular structures. Most lesions had a violaceous 27

(25.96%) and gray background 23 (22.11%) while others had a mixed gray-blue 16 (15.38%) and gray-violet 16 (15.38%) background. Lesions in people of fair skin tend to have violet, pink, brown or even yellow background<sup>8,25</sup> while lesions in darker skin types have violet, gray, mixed violet/gray background<sup>9</sup> due to the higher melanin content that may influence the background appearance. Pigmentary changes were mostly brown color in 72 (69.23%) and mostly of patch pattern in 40 (38.46%) similar to findings from Tanzania.<sup>9</sup> This pattern is likely influenced by the melanin content and effects of UV exposure as contrasting findings are reported in people of fairer skin types.<sup>26,24</sup>

Wickham striae (WS) is often a significant dermoscopic finding in lichen planus.<sup>24,26,27</sup> Similarly, in our study it was seen in 82 (78.85%) CI (71.00% to 86.70%). Most WS was of the reticulate 22 (21.15%) and diffuse 15 (14.42%) patterns. Other findings unique to our study were non-vascular features such as globules (11.54%) and white patchy scales (18.27%). Vascular changes were characterized by dominant red dots (6.73%) of a peripheral arrangement (2.88%). Some of these findings are probably unique to people with darker skin types.

### **Conclusion**

Classical and hypertrophic were the most common forms of lichen planus. Zosteriform LP a rarely reported form was least observed. Most lesions had a violaceous or a grayish background, and had brown pigments arranged peripherally with a reticulate and diffuse wickham's striae patterns. Most patients had a moderate to very large effect on their quality of life. Itchy skin and a feeling of embarrassment significantly affected the quality of life.

### **Recommendation**

1. Routine assessment of quality of life that encompasses mental, physical, and social well-being should be incorporated in the management of lichen planus.
2. Adopting dermoscope in our health facilities will close the gap in the unmet need for dermatopathologists.

### **Strength**

The study included cutaneous, nail, scalp and mucosa variants compared to other studies and use of validated DLQI tool.

### **Limitation**

This was a single-site study.

### **Abbreviations**

CALP	Cutaneous Actinic lichen planus
CCLP	Cutaneous Classical lichen planus
CHLP	Cutaneous Hypertrophic lichen planus
CLP	Cutaneous lichen planus

CLPP	Cutaneous Lichen planus pigmentosus
CLPPE	Cutaneous Lichen planus pemphigoid
DLQI	Dermatological Life Quality Index
DRGT	Directorate of Research and Graduate Training
DSO	Distal Splitting/Onycholysis
FRC, MUST	Faculty of Research Committee, Mbarara University of Science and Technology
LP	Lichen planus
MELP	Mucosal Erosive lichen planus
MPLP	Mucosal Papular Lichen planus
MRLP	Mucosal Reticular lichen planus
MRRH	Mbarara Regional Referral Hospital
MUST	Mbarara University of Science and Technology
OLP	Oral Lichen planus
QoL	Quality of Life
REC, MUST	Research Ethics Committee, Mbarara University of Science and Technology
WS	Wickham striae

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**LEGEND OF FIGURES**

Figure 1; Distribution of participant’s age by gender

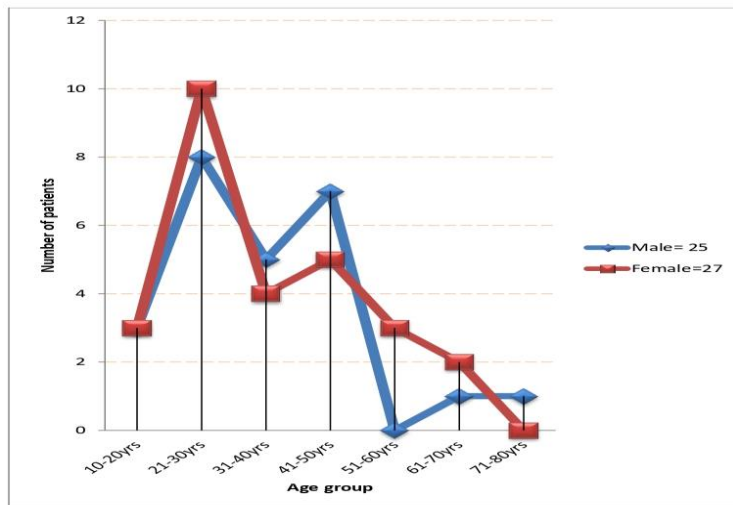


Figure 2; Distribution of specific quality of life domains affected among adult patients

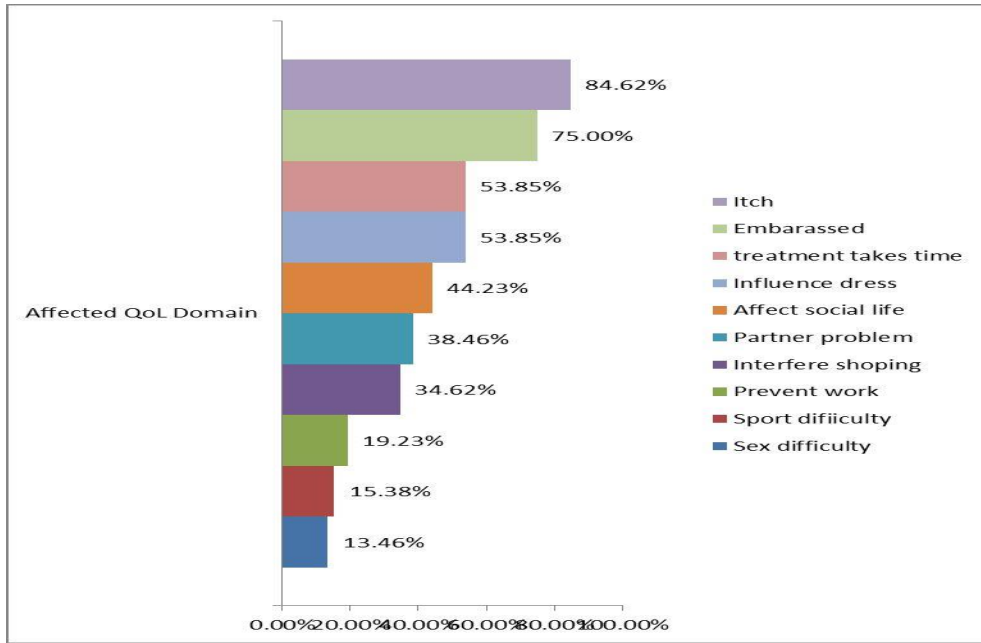


Figure 3; Clinical variants of lichen planus based on location

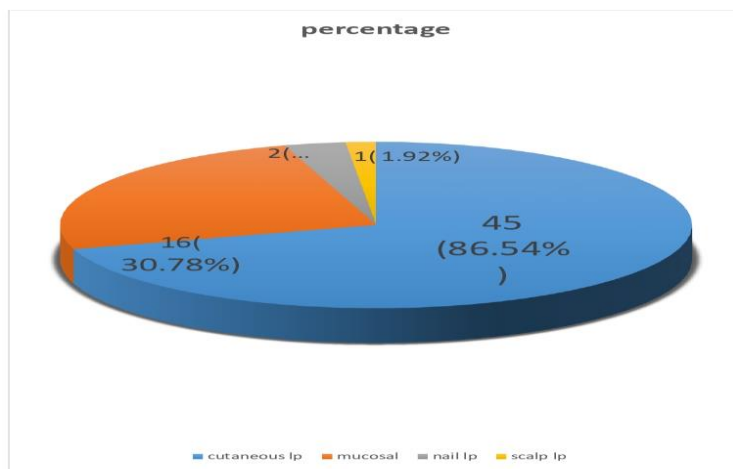


Figure 4a, b, c and d; Cutaneous classical lichen planus



Figure 4e; Koebnerization



Figure 5a & b; Hypertrophic lichen planus



Figure 6a; mucosal oral reticular variant of lichen planus on vermillion



Figure 6b; Mucosal oral reticular variant of lichen planus on buccal



Figure 6c Nail lichen planus



Figure 7; mixed types of LP clinical variants based on location and morphology.

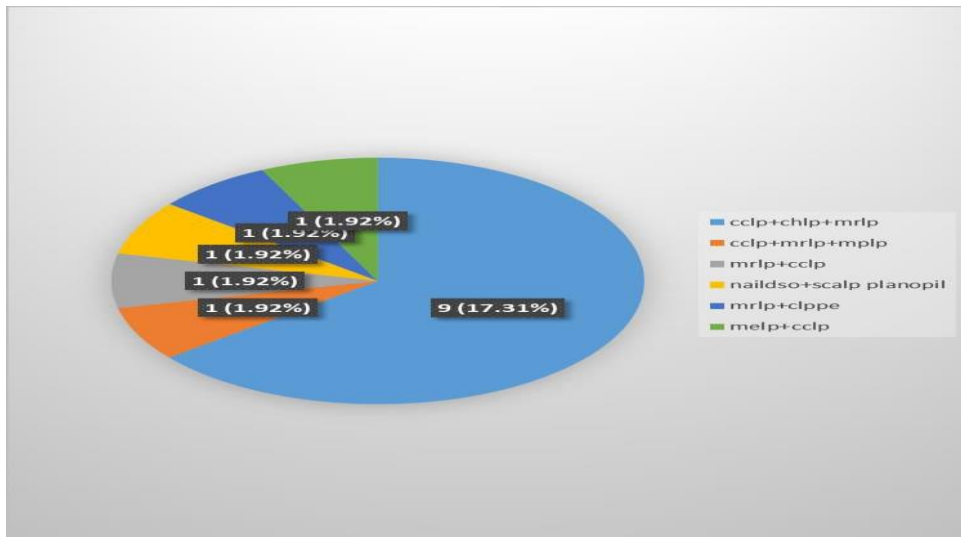


Figure 8a; Gray background, identified by the red arrow.

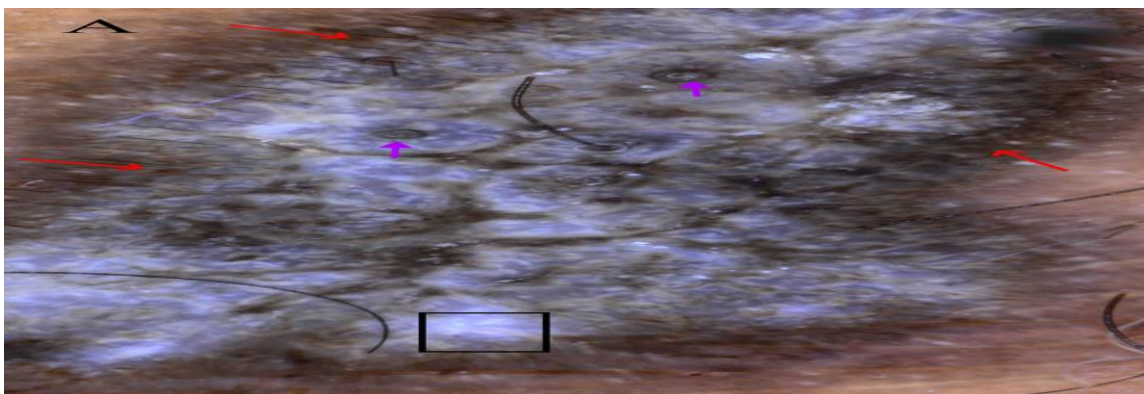


Figure 8b; Violet background represented by the yellow arrow.

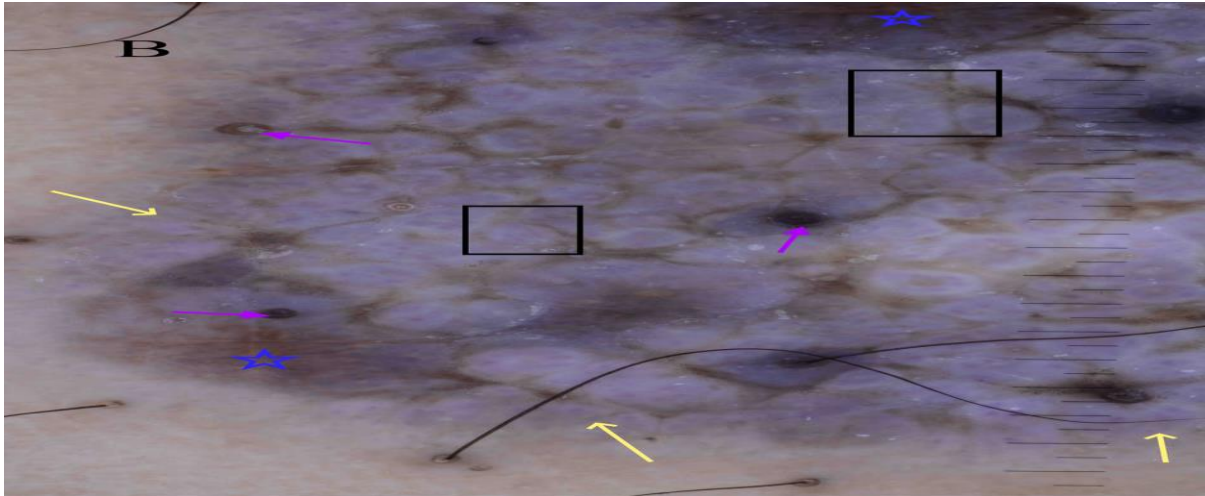


Figure 8c; Reticulate Wickham striae, outlined within black boxes.

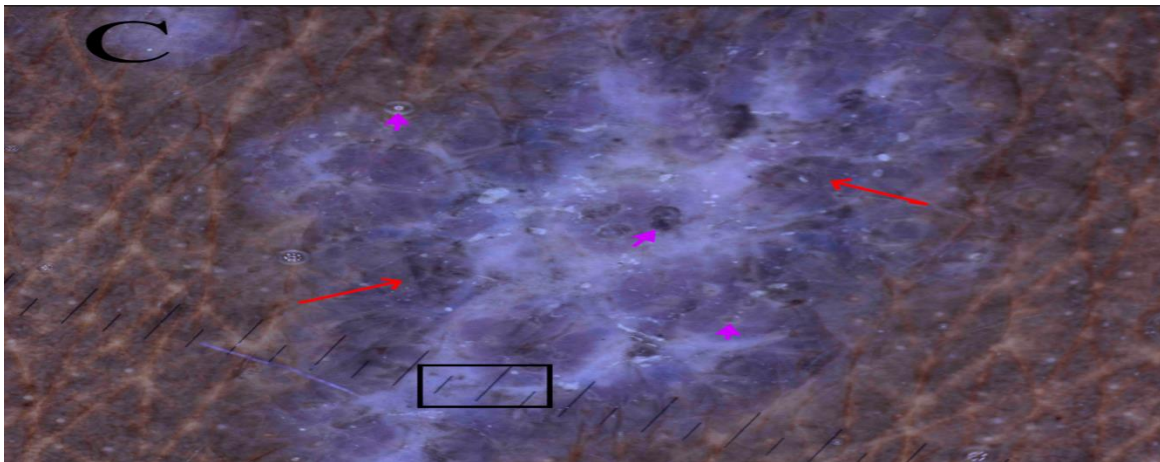


Figure 8d; Pigmentary changes in brown color are indicated by the blue star.

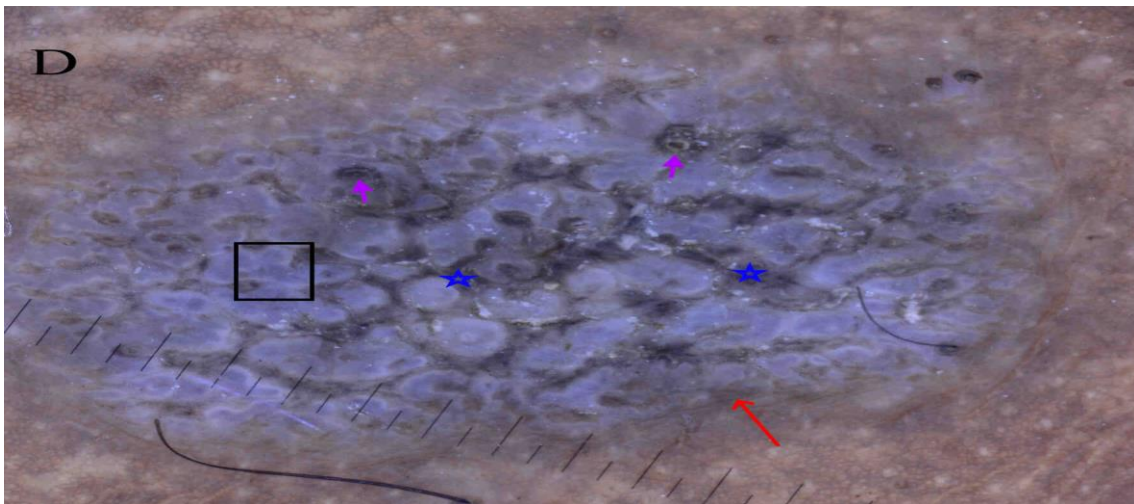


Figure 8e; Pigmentary changes in brown color are indicated by the blue star, Reticulate Wickham striae, outlined within black boxes

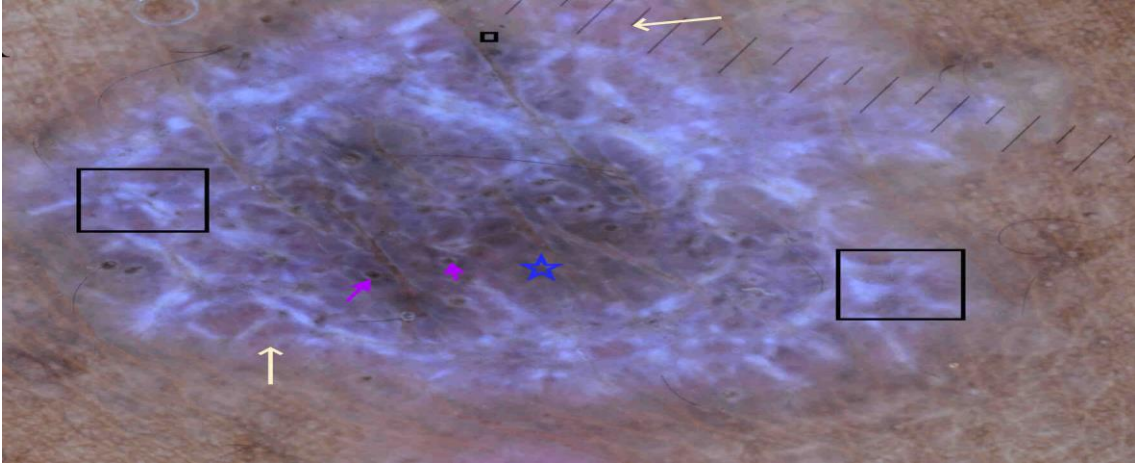


Figure 9a; Reticulate Wickham striae, outlined within black boxes.

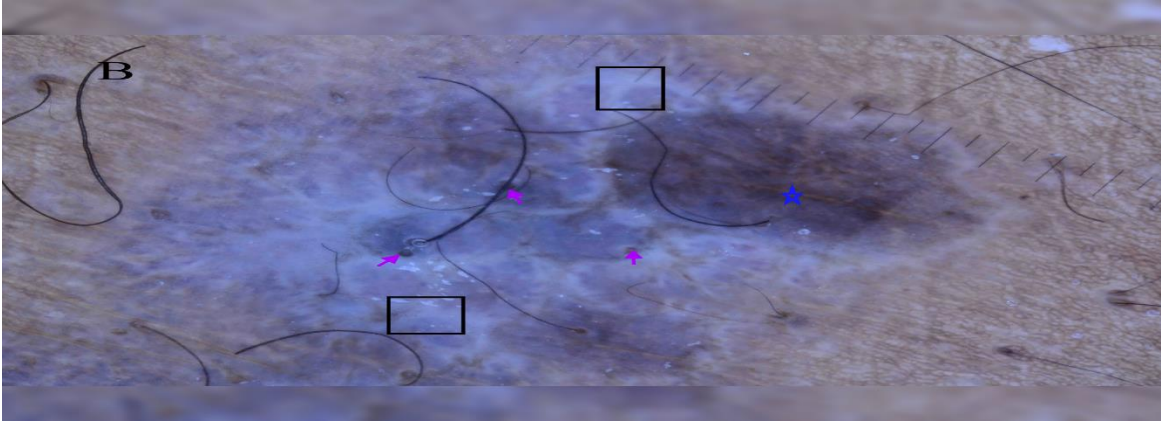


Figure 9b; Non-vascular structures resembling globules presented by purple full arrow

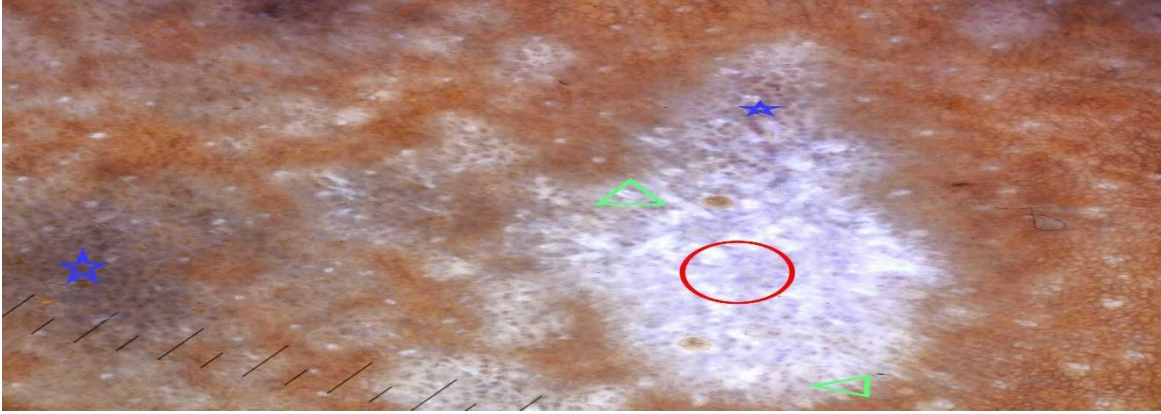
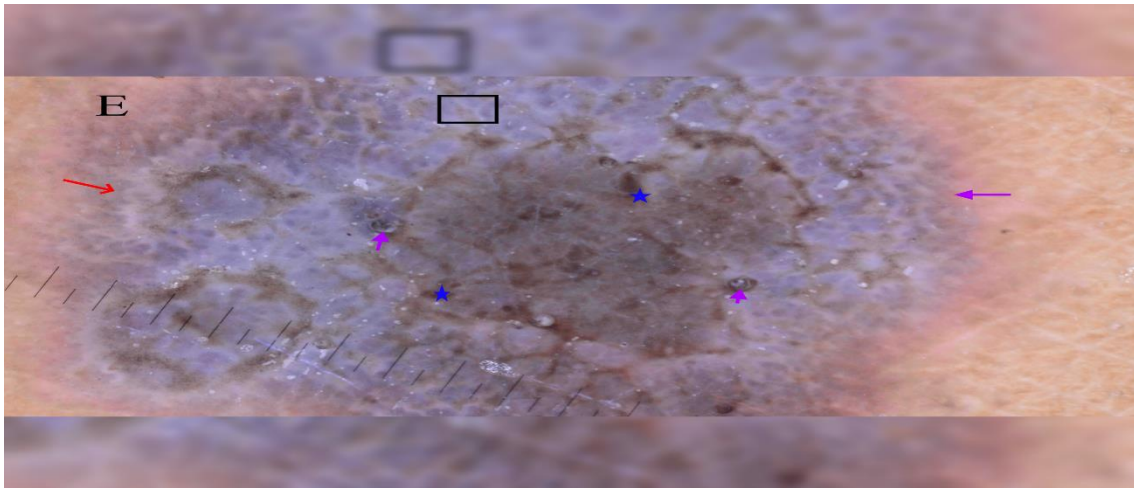


Figure 9c; Radial streaming Wickham striae are marked with green triangles.



Figure 9d; Diffuse Wickham striae presented in red circle.



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Table 1: Distribution of participant age categories

Classification	Category	Frequency (%)
Median	<b>34.5 IQR 25:47</b>	
Age	<b>21-30yrs</b>	<b>18(34.62)</b>
	41-50yrs	12(23.08)
	31-40yrs	9(17.31)

	10-20yrs	6(11.54)
	61-70yrs	3(5.77)
	51-60yrs	3(5.77)
	71-80yrs	1(1.92)
<b>Gender</b>	<b>Female</b>	<b>27(51.92)</b>
	Male	25(48.08)

Table 2: Degree of quality of life impairment among adult patients at the MRRH skin clinic

Range of scores	Frequency and proportion (%)	DLQI Interpretation
0 - 1	7(13.46)	No effect on quality of life
2 - 5	8(15.38)	Small effect on quality of life
6 - 10	13(25.00)	Moderate effect on quality of life
<b>11- 20</b>	<b>19(36.54)</b>	<b>Very large effect on quality of life</b>
21- 30	5(9.62)	Extremely large effect on quality of life

Table 3: DLQI subscale score among adult patients with LP at MRRH skin clinic

DOMAIN	MEAN	(+/-)SD	MIN	MAX
<b>Symptoms and feelings</b>	<b>3.63</b>	<b>0.27</b>	<b>0</b>	<b>6</b>
Daily activities	1.98	0.26	0	6
Leisure	1.31	0.25	0	6
Work and School	0.36	0.12	0	3
Personal relationship	1.23	0.25	0	6
Treatment	1.21	0.18	0	3
<b>Total DLQI scores</b>	<b>9.73</b>	<b>0.88</b>	<b>0</b>	<b>30</b>
	<b>Moderate effect</b>			

Table 4: Chi square analysis of quality of life among patients with LP at the MRRH skin clinic

Characteristic	QoL impaired		Degree freedom $\chi^2$	of P value
	no	yes		
Has no Itch	3	5	1	.000
Has Itch	0	44	17.5102	
Not Embarrassed	3	10	1	.002
Embarrassed	0	39	9.5510	
Not-Interfered shopping	3	31	1	.194
Interfered shopping	0	18	1.6855	
Doesn't Influence dress	3	21	1	.054
Influence dress	0	28	3.7143	
Norma social life	3	26	1	.112
Affect social life	0	23	2.5250	
Doesn't affect sport	3	41	1	.447
Affect sport	0	8	0.5788	
Doesn't prevent work	3	39	1	.384
Prevent work	0	10	0.7580	
No partner problem	3	29	1	.158
Partner problem	0	20	1.9898	
No Sex difficulty	3	42	1	.482
Sexual difficulty	0	7	0.4952	
Treatment doesn't take time	3	21	1	.054
Treatment takes time	0	28	3.7143	

Table 5: Clinical variant of LP based on morphology among adult patients at the MRRH skin clinic (n=52)

CUTANEOUS LP VARIANTS	FREQUENCY (N)	PERCENTAGE (%)
<b>Classical LP</b>	<b>26</b>	<b>50.00</b>
Hypertrophic LP	12	23.08
LP Pigmentosus	6	11.54
LP Pemphigoides	1	1.92
Palmoplantar LP	2	3.85
Actinicus LP	5	9.62
Linear LP	3	5.77
Exanthematous (Acute)LP	1	1.92
Bullous LP	1	1.92
Blackshoid LP	1	1.92
Annular LP	2	3.85
Zosteriform LP	1	1.92
<b>Classical + Hypertrophic LP</b>	<b>7</b>	<b>13.46</b>
Classical + Actinicus LP	2	3.85
Classical + Palmoplantar LP	1	1.92

Table 6: Other LP variants based on site and morphology (mucosal, scalp, and nail) among adult patients at the MRRH skin clinic

Other LP variants			Frequency(n)	Percentage (%)
Mucosal	<b>Oral</b>	<b>Reticular</b>	<b>9</b>	<b>17.31</b>
		Erosive	1	1.92
		Reticular + erosive	2	3.85
		Papular	3	5.77

	Genital	Plaque	1	1.92
Scalp		Diffuse	0	0
		<b>Planopilaris</b>	<b>1</b>	<b>1.92</b>
Nail		Distal Splitting/Onycholysis	2	3.85
		Yellow to Brown Discoloration	2	3.85
		Subungual Hyperkeratosis	2	3.85
		Chromonychia	2	3.85
		Lateral thinning	1	1.92
		Dorsal pterygium formation	1	1.92
		Twenty nail dystrophy	1	1.92
		Melanonychia	1	1.92

Table 7: Dermoscopic feature of lichen planus among adult patients at the MRRH skin clinic

FEATURE	PRESENTATION	NUMBER OF LESIONS (%)
Background		<b>Total 104</b>
	Violet	27(25.96)
	Grey	23(22.11)
	Grey-blue,	16(15.38)
	Grey-violet	16(15.38)
	Cream , brown	8(7.69) each
	Violet + brown,	4(4.16)
	Red, skin colored	1(0.96) each
Pigmentary change color	Brown	72(69.23)

	Grey	6(5.77)
	Black	5(4.81)
	Brown blue	1(0.96)
Pigment change pattern		
	Patch	40(38.46)
	Reticulate	17(16.35)
	Dot	13(12.5)
	Dot + patch	3(2.88)
	Radial stream, starry, dot +starry	2(1.92) each
	Group dot, diffuse, dot+line, line, peripheral	1(0.96) each
Wickham's striae		<b>82(78.85)</b>
	Reticulate	22(21.15)
	Diffuse	15(14.42)
	Radial stream	6(5.77)
	White dot, patchy, petaloid	5(4.81) each
	Starry	4(3.85)
	Linear, structureless	3(2.88) each
	Reticulate+radialstream, centered,circular,	2(1.92) each
	Radial+linear, linear+patch, peripheral, reticulate+diffuse, reticulate+petaloid, diffuse+centered	1(0.96) each
Non vascular		
	Globules	12(11.54)
	Black round, cream reticulate,	4(3.85)
	Cream patchy	3(2.88)
	Reticulate, crust, brown round	2(1.92) each
	Yellow radial stream, yellow patchy, cream radial stream,cream dot,comodolike,corn pearl,erosion,viliform,circular,brown patchy, globule+atrophic	1(0.96) each
Scale color		
	Whites	19(18.27)
	White pp, yellow	1(0.96)
Scale configuration		

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	Patchy	6(5.77)
	Diffuse , scattered, peripheral	4(3.85) each
	Central	2(1.92)
Vascular arrangement		
	Peripheral	3(2.88)
	Patchy, reticulate, scattered, centered, macules	1(0.96) each
Vascular structure		
	Red dot	7(6.73)
	Patch	1(0.96)

### **Acknowledgement**

The authors do hereby extend their sincere appreciation to all the study participants and healthcare workers at study site skin clinic. We would also like to acknowledge the Regional Referral Hospital for enabling us to carry out this study in their facility.