

## Research Article

# A Histopathologic Study of Cutaneous Lesions of Lupus Erythematosus

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**Abstract:** Cutaneous involvement is a prominent feature in connective tissue disease and the skin lesions are extremely important in diagnosing and sub classifying patients with these conditions. Lupus erythematosus, is an important condition in this group of diseases often presents with different cutaneous manifestations. Twenty cases of cutaneous lupus erythematosus were studied over a period of two years to analyze overlapping of histopathological features, possible transformation of one disease to the other and co-existing conditions. Routine Haematoxyline and Eosin (H&E) sections were studied along with special stain Periodic Acid Schiff (PAS). Twenty cases studied included nine discoid lupus erythematosus (DLE), seven acute cutaneous lupus erythematosus (ACLE) and four cases of subacute cutaneous lupus erythematosus (SCLE). Considerable overlapping of features was observed among skin lesions in acute, subacute and chronic lesions of lupus erythematosus. In conclusion, as there is a considerable overlapping of histopathologic features in different cutaneous lesions of lupus erythematosus, often it is necessary to use other diagnostic tools like serological and immunological study, in conjunction with histopathology with the background of clinical history, for a conclusive diagnosis.

**Keywords:** lupus erythematosus, cutaneous lesions, histopathologic features, overlapping features

## INTRODUCTION

Lupus erythematosus (LE) is a disease that affects multiple organ systems and has a broad range of clinical manifestations. It may take the form of an isolated cutaneous eruption or a fatal systemic illness [1]. Cutaneous lesions of LE include chronic cutaneous lupus erythematosus/discoid lupus erythematosus (DLE), subacute cutaneous lupus erythematosus (SCLE) and acute cutaneous lupus erythematosus (ACLE). As there is a considerable overlapping of clinical and pathologic features, diagnosing and sub classifying these cutaneous lesions are extremely important [2].

## MATERIALS AND METHODS

Work attributed is to Department of Pathology, K.V.G .Medical College, Sullia, D.K, Karnataka, India. This was a prospective histopathologic study of cutaneous lesions of lupus erythematosus undertaken by the department of pathology and includes 20 cases of clinically diagnosed / suspected cases who attended the department of dermatology of a medical college hospital in south India, in a period of two years. A brief history was taken and dermatological examination was carried out to evaluate the type, distribution, configuration and topography of the lesions. Clinically established / suspected cases of lupus erythematosus were biopsied. After routine processing and paraffin embedding of formalin fixed tissue Haematoxyline and Eosin (H&E) sections were studied. Special stain, periodic acid Schiff (PAS) was used in all the cases.

Various histopathological changes were studied with clinical correlation. The cutaneous lesions of lupus erythematosus (LE) was further classified into discoid, subacute and acute (DLE, SCLE and ACLE) LE according to the classification made by Gillian and Sontheimer [3].

## RESULTS

Among twenty cases of cutaneous forms of lupus erythematosus discoid lupus erythematosus (DLE) (nine cases) was the commonest, followed by acute cutaneous lupus erythematosus (ACLE) (seven cases) and subacute cutaneous lupus erythematosus (SCLE) (four cases).

Cutaneous lesions of lupus erythematosus were commonly seen in the middle age group between 21-50 years (Table.1) and common among females with a male:female ratio being 1:1.9 (Table.2).

## DISCUSSION

The term connective tissue disease has evolved from older designation of “collagen disease” and “collagen-vascular disease” and constitutes a group of multisystem diseases that are remarkably diverse and at the same time clinically similar in many aspects [2].

Cutaneous lupus erythematosus (LE), an important condition in this group of diseases and can be divided into two broad categories; LE specific skin lesions and

LE nonspecific but connective tissue disease-related skin lesions. LE specific skin lesions are chronic cutaneous LE which includes different forms of discoid lupus erythematosus (DLE), subacute cutaneous lupus erythematosus (SCLE) and acute cutaneous lupus erythematosus (ACLE) which includes different clinical forms [2].

Lupus erythematosus is a disease that affects multiple organ systems with broad range of clinical

manifestations, may take the form of an isolated cutaneous eruptions often without any systemic involvement as seen in DLE, as an uncommon, non-scarring variant of LE often associated with mild systemic features (SCLE) or as acute cutaneous lesion of systemic LE (ACLE) [4, 5]. Hence it is extremely important to diagnose and sub classify different cutaneous forms of LE.

**Table 1: Age distribution of 20 cases of cutaneous lupus erythematosus**

Age group	DLE	SCLE	ACLE	Total
0 – 10	-	-	-	0
11 - 20	-	-	-	0
21 - 30	3	1	-	4
31 - 40	5	2	1	8
41 - 50	-	1	4	5
51 - 60	-	-	1	1
61 - 70	1	-	1	2
<i>Total</i>	9	4	7	20

DLE- Discoid lupus erythematosus, SCLE- Subacute cutaneous lupus erythematosus, ACLE – Acute cutaneous lupus erythematosus

**Table 2: Sex distribution in individual diseases**

Disease	Male		Female		Male: Female ratio	Total No. of cases
	No. of cases	%	No. of cases	%		
<b>DLE</b>	4	44.4	5	55.6	1:1.2	9
<b>SCLE</b>	-	-	4	100	0:4	4
<b>ACLE</b>	3	42.9	4	57.1	1:1.3	7

DLE- Discoid lupus erythematosus, SCLE- Subacute cutaneous lupus erythematosus, ACLE – Acute cutaneous lupus erythematosus

**Table 3: Comparison of important features observed in the present with a study done by Bangert JL *et al.* [7]**

Factor	Bangert JL <i>et al.</i> (1984) (12 cases of SCLE and 26 cases of DLE)		Present study (2012) (4 cases of SCLE and 9 cases of DLE)	
	SCLE	(DLE)	SCLE	(DLE)
Hyperkeratosis	12	(26)	2	(5)
Epidermal atrophy	10	(11)	2	(3)
Basement membrane thickening	8	(19)	1	(9)
Density of lymphocytic infiltration				
-Superficial perivascular	12	(26)	4	(9)
-Deep perivascular	2	(17)	2	(9)
-Periappendageal	7	(24)	2	(9)
Follicular plugging	2	(14)	3	(5)
Epidermal colloid bodies	3	(11)	3	(2)
Dermal colloid bodies	3	(6)	3	(3)
Liquefaction degeneration interface	8	(19)	3	(7)
Subepidermal edema	3	(3)	3	(3)

Numbers within parentheses are DLE cases. DLE- Discoid lupus erythematosus, SCLE- Subacute cutaneous lupus erythematosus

**Table 4: Comparison of important features observed in SCLE and ACLE in the present study**

Factors	SCLE (4 cases)		ACLE (7 cases)	
	No. of cases	%	No. of cases	%
Hyperkeratosis	2	50	3	42.9
Epidermal atrophy	2	50	4	57.1
Follicular plugging	3	75	6	85.7
Epidermal colloid bodies	3	75	5	71.4
Dermal colloid bodies	3	75	2	28.6
Basal vacuolation				
-Dermoepidermal	3	75	7	100
-Pilosebaceous	1	25	1	14.3
Basement membrane thickening	1	25	-	
Dermal melanosis	3	75	3	42.9
Subepidermal edema	3	75	6	85.8
Lymphocytic infiltration (mild)				
. Perivascular				
- Papillary dermis	3	75	6	85.7
- Reticular dermis	2	50	1	14.3
. Periappendageal	4	100	4	57.1

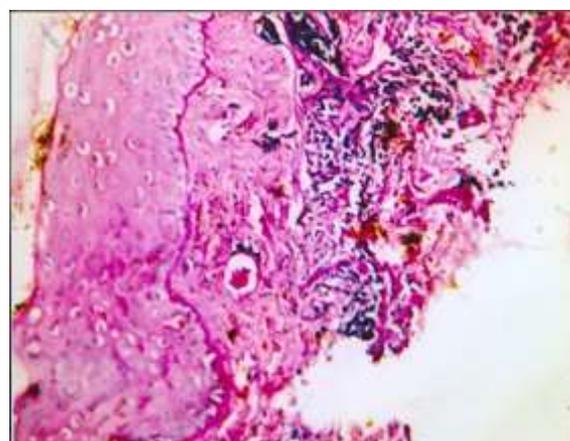
SCLE- Subacute cutaneous lupus erythematosus, ACLE – Acute cutaneous lupus erythematosus

In the present study 20 cases of cutaneous LE were encountered. Nine were DLE, seven cases were ACLE and four cases were diagnosed as SCLE. Most of them were between 21-50 years of age. The male to female ratio was approximately 1:1.9 compared to 1:2.7 in a study conducted by Jerden MS *et al.* [6]. As per the study of Bangert JL *et al.* [7] the important features in distinguishing between DLE and SCLE were as follows: hyperkeratosis, epidermal atrophy, basement membrane thickening, density and depth of cellular infiltration, and follicular plugging. Table.3 shows comparison of these features with the present study.

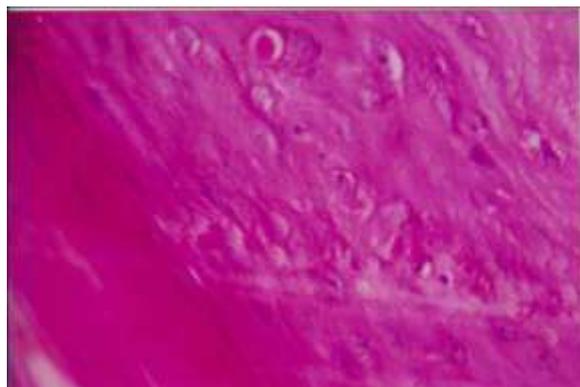
McCright WG *et al.* [8] who studied histopathology of 119 specimens of different forms lupus erythematosus stated that, though similar changes were noticed in different forms of the disease, there was some variation in the degree of changes. Jerdan MS *et al.* [6] studied 63 patients of subsets of LE and histologically sub typed all the cases.

In the present study we sub typed all the cutaneous lesions of lupus erythematosus into DLE, SCLE and ACLE histologically with clinical correlation. Features like basement membrane thickening, dense lymphocytic infiltration in the dermis were seen in chronic discoid lesions and features like basal cell vacuolation, subepidermal oedema, colloid bodies, mild lymphocytic infiltration in the dermis, were often found in acute and subacute lesions. PAS stain revealed the thickened basement membrane in all the cases of chronic cutaneous lupus erythematosus (DLE) (Fig. 1), which was not found in SCLE and ACLE lesions.

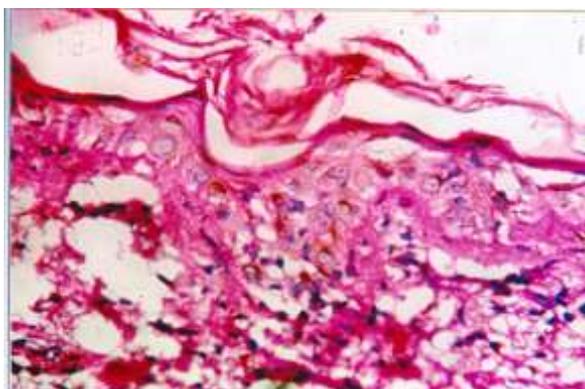
PAS positive colloid bodies, [9] (Fig. 2) as large, eosinophilic round homogenous bodies formed as a result of degeneration of basal keratinocytes were seen in three cases of SCLE and in five cases of ACLE. The acute forms of cutaneous lesions of lupus erythematosus usually portray more oedema and less infiltrate than the subacute type [10] (Fig. 3). The combination of atrophy of the epidermis and marked liquefaction degeneration of the basal layer is strongly suggestive of subacute lupus erythematosus [11]. In the present study it is found that, the acute and subacute cutaneous lesions of LE display similar histological features (Table 4) and distinguishing these two conditions based on histopathology alone was extremely difficult. Final histological diagnosis of these conditions was made after considering complete clinical details.



**Fig. 1: Discoid lupus erythematosus showing basement membrane thickening (PAS, 10x40)**



**Fig. 2: Subacute cutaneous lupus erythematosus showing hyperkeratosis and colloid bodies (H&E,10 x 40)**



**Fig. 3: Acute cutaneous lupus erythematosus showing hyperkeratosis, follicular plugging, basal cell vacuolation and upper dermal oedema with mild lymphocytic infiltration (H&E,10 x 40), H&E – Haematoxyline and Eosin, PAS – Periodic acid Schiff**

#### CONCLUSION

As cutaneous lesions of lupus erythematosus overlap both morphologically and in distribution often the diagnosis is difficult. Though the histological features are distinct and specific in some, often there is overlapping of features. As the cutaneous lesions in LE may take the form of an isolated cutaneous eruption often without any systemic involvement as in DLE, as an uncommon, non-scarring variant often associated with mild systemic features (SCLE) or as acute cutaneous lesion of systemic LE (ACLE), it requires a combination of histopathology, serological and

immunological study with the background of clinical history for a conclusive diagnosis.

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