

HISTOPATHOLOGY OF LICHEN PLANUS BASED ON ANALYSIS OF ONE HUNDRED BIOPSY SPECIMENS*

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Lichen planus has characteristic clinical and histopathological features which make the diagnosis relatively easy. In a previous study (1), the microscopic findings in lichen planus were considered to be more than 90 per cent diagnostic.

METHOD

One hundred cases clinically accepted as lichen planus were studied. A biopsy specimen from each patient was fixed in 5 percent neutral formalin, and was stained with hematoxylin eosin.

RESULTS

Although there was some variability in histologic features, all of the sections examined were sufficiently characteristic of lichen planus to verify the clinical impression. A summary of the histopathologic findings is presented in Chart I.

Parakeratosis was present in thirteen sections. In twelve, the areas of parakeratosis were small and irregularly spread over the surface; otherwise, the keratinization was regular. The surface of one section revealed crusting. The characteristic hyperkeratosis without parakeratosis of lichen planus was present in the other 87 specimens.

Beading of the granular layer was present in 93 sections and absent in seven.

Acanthosis of several forms was recognized. In nine sections, the malpighian layer was increased to form an epithelial papule (McCarthy) (2). Twenty-three sections revealed acanthotic epithelial ridges with epidermis of normal thickness between the ridges.

Epidermal atrophy was apparent in some areas in forty-seven sections. In twenty-one sections neither atrophy nor hypertrophy of the epidermis was pronounced.

Liquefaction degeneration is characterized basal-cell layer of the epidermis with vacuolization of variable number of basal cells, a loss of the usual morphology of the basal cells, and

in many cases, also of the lower rete cells. This may result in loss of cohesiveness between the individual basal cells, and between the epidermis and the dermis, and was present in at least a portion of each biopsy specimen.

Max Joseph Spaces or small blisters underlying several or more contiguous basal cells were apparent in seventeen of the one hundred sections. In many of such spaces a serous or faintly eosinophilic fluid was deposited and at times a few mononuclear cells were present. In several of the sections an enlarged space or subepidermal vesicle was seen.

Eosinophilic bodies.—The term eosinophilic bodies in lichen planus is applied to the colloid or hyalin bodies which may be present in the rete cells as deeply staining intracellular material in sections stained with hematoxylin-eosin. The colloid material usually fills the cell and the nuclei either disappear or are shrunken and pyknotic. Eosinophilic bodies were present within the epidermis of thirty-seven sections (Fig. 2 and 3). These bodies were usually present in the mid- and lower rete and were interspersed between apparently normal epithelial cells. Some were slightly smaller than the normal epithelial cells. Often an intracellular clear area, which appeared to be due to shrinkage, surrounded a completely homogenized mass which stained deeply eosinophilic with hematoxylin-eosin. Many such bodies contained basophilic dots or masses which resembled pyknotic or fragmented nuclei.

Dermal infiltrate appeared as a distinct band, closely applied to the epidermis, and was present in all one hundred sections. Most of the cells were small, mononuclear lymphocytic cells. In eighty-two sections some epithelial cells were observed, and in eighteen many epithelial cells were seen within the infiltrate. Fibrocytes were recognized in five, and three sections contained many scattered plasma cells. In one section some giant cells were seen, and in one, some polymorphonuclears were mixed with the lymphocytes. Mild perivascular cuffing of small mononuclear

Received for publication March 11, 1966.

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CHART NO. I

Summary of the histopathologic findings in one hundred (100) cases of lichen planus

Epidermis, 100 cases		Dermis, 100 cases	
	Epidermis, 100 cases		Dermis, 100 cases
1	Parakeratosis	12	Infiltrate
	Crusting	1	Band-like configuration hugging the basal layer
2	Beading of granular layer	93	Mostly small mononuclears (lymphocytes)
3	Acanthosis with linear lower margin	9	Sparse or few epithelioid cells
4	Acanthosis of ridges only	23	Many epithelioid cells
5	Atrophy with and without ridges	47	Fibrocytes
6	Eosinophilic bodies	37	Plasma cells
7	Liquefaction degeneration at the basal layer	100	Giant cells
8	Max Joseph spaces	17	Polymorphonuclears
9	Follicular lesions	6	
10	Lichen nitidus-like lesions	8	

Since these figures are based on 100 cases, the numbers also equal the percentages.

cells was present in the mid- and lower dermis in some sections.

Follicular lesions (lichen plano-pilaris-like lesions) were prominent in six sections. In these sections dense perifollicular infiltrate extended deeply into the dermis.

Lichen nitidus-like lesions in which the dermal and epidermal changes were contained between several rete ridges and essentially absent between adjacent dermal papillae were recognized in eight of the one hundred sections.

DISCUSSION

Most of the characteristic histopathologic features of lichen planus were encountered with regularity in this study, but several observations are worthy of special consideration. Lever (3a), in the third edition of his textbook, states that if more than slight spotty parakeratosis is present, a diagnosis of lichen planus should not be made on histologic grounds.

Infiltrate.—In typical lichen planus there is usually a well-defined infiltrate, in apposition to the basal layer, consisting primarily of small lymphocytes, a few polymorphonuclear leukocytes, epithelioid cells, and some plasma cells. The presence of a very mild deeper perivascular infiltrate of small lymphocytes may occasionally occur.

Weidman (4) stated that individual epithelioid cells, particularly when intermingled

with other cells, can not be recognizable as such. Differentiation of this type of cell from histiocytes, fibroblasts and various reticulum cells is impossible unless they occur in aggregates as in tubercles, etc.

Max Joseph spaces.—The appearance of liquefaction degeneration of the basal cells and extracellular fluid accumulation about the individual basal cells is strongly suggestive of mild irritation. These edematous changes partly account for the frayed appearance of the lower rete, and the poor definition of the dermal-epidermal junction. More advanced accumulation of fluid results in the appearance of Max Joseph spaces found in the areas of liquefaction degeneration and when large form vesicles which are occasionally seen clinically in lichen planus.

Percival *et al* (5) stated that small collections of fluid may accumulate just beneath the basal layer, causing it to separate from the dermis. Lever (3b) remarked that occasionally there are small areas of separation between the epidermis and the corium (hole formation).

According to Hermann Pinkus (6), Max Joseph was among the first to stress the 'lichenbildung' between the epidermis and corium. "Max Joseph Spaces" refers to the subepidermal cleft of lichen planus, and Juliusberg's article in Jadassohn's *Hundbuch* supported this.

Lichen nitidus-like lesions.—Wilson and

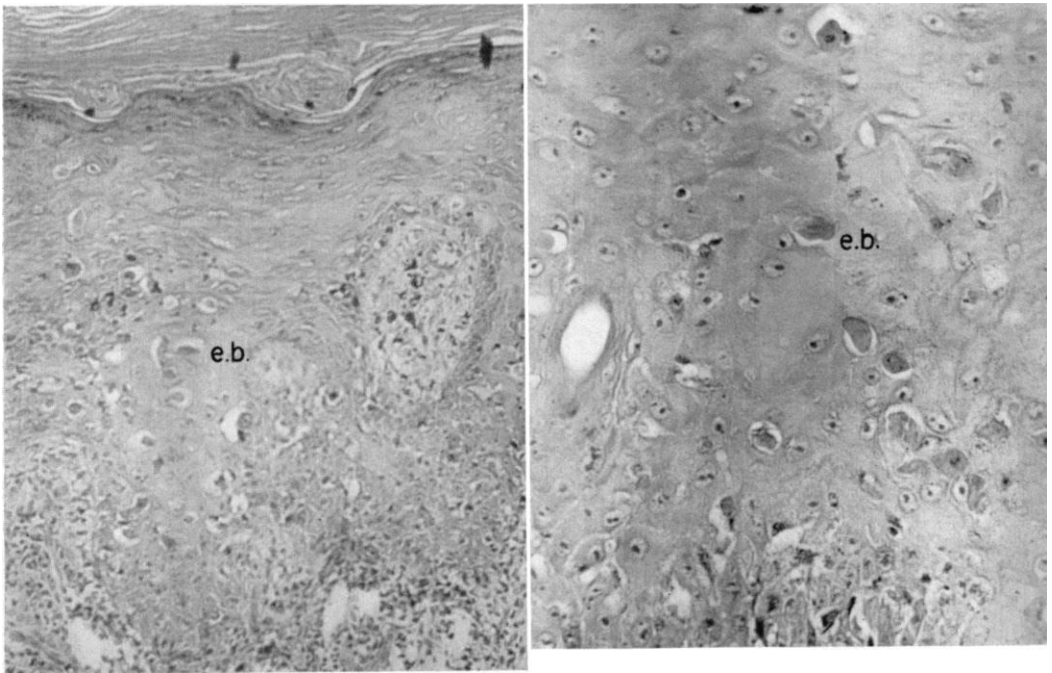


FIG. 1. Low power shows a typical histologic picture of lichen planus. There is hyperkeratosis without parakeratosis, a strong granular layer with a suggestion of beading, some thickening of the rete in some areas and some thinning of the rete in other areas; vacuolization at the epidermal-dermal junction and a well-defined, band-like infiltrate in the dermis consisting mostly of small monocytes, hugging the basal layer. Some of the rete cells contain eosinophilic bodies which suggest individual keratinizing cells or viral altered cells.

FIG. 2. Medium power shows hyperkeratosis without parakeratosis, an increase in the granular layer, vacuolization of the cells in the lower rete and basal layer, eosinophilic bodies (e.b.) in the epidermis and Max Joseph spaces (vesicles) at the dermal epidermal junction.

FIG. 3. High power. In the epidermis one sees a fair number of eosinophilic bodies (e.b.). They may suggest individual keratinizing cells. Some have lost their nuclei and in others the nuclei appear pyknotic. There is some intracellular vacuolization of the rete cells. At the bottom of the photograph there is some liquefaction degeneration of the basal layer.

Bett (7) reported that of the twenty-five cases of lichen planus with miliary lesions eight biopsy specimens showed a lichen nitidus-like picture histologically. Altman and Perry (8) did not report the presence of this feature in any of the ninety-three biopsy specimens of lichen planus they examined histologically. In the present series, eight biopsy specimens revealed in some areas a histologic picture suggestive of lichen nitidus.

Eosinophilic bodies.—Eosinophilic bodies within the epidermis have been observed previously. Sabouraud (9), in 1910, described eight cases of lichen planus in which edema developed in the lower layers of the epidermis which caused colloid to form in the epidermal cells. He did not consider the probability that the red staining material was modified keratin. He suggested that the pinching off of these colloidal cells produced giant cells in the papillary layer. Sabouraud did not think that the giant cells in the dermis were due to the infiltrate. Sabouraud stated that the lichen planus lesion was primarily dermal and that the infiltrate invades the lower layers of the epidermis. The epidermal cells of the basal layer tend to become edematous or to undergo colloid degeneration, and may then be trans-

formed into giant cells of epithelial origin. Therefore, Sabouraud considered the giant cells in the upper cutis to be directly descendent from colloiddally altered rete cells found in the lower part of the epidermis. See Fig. 4.

Herxheimer (10) (1932) and Gans and others described the colloid bodies in lichen planus, mycosis fungoides, carcinoma, chronic eczema, psoriasis, and other dermatoses.

Thyresson and Moberger (11), in 1957, described "colloid" or "hyaline" bodies in lichen planus and postulated a viral etiology. These bodies are found in basal layer or in deep intradermal accumulations primarily in very early lesions. They suggested that the manner in which they took the stain could be the result of a high nucleoprotein content, and the nuclear pyknosis could result from a virus infection. In some cases they observed the accumulation of hyaline bodies in edematous pockets deep in the corium. In this latter area the changes could have been mistaken for disintegrating collagenous connective tissue bundles.

Thyresson and Moberger stated that the changes undergone by the epithelial cells in the cases of lichen ruber planus demonstrated here show strong and striking resemblance to

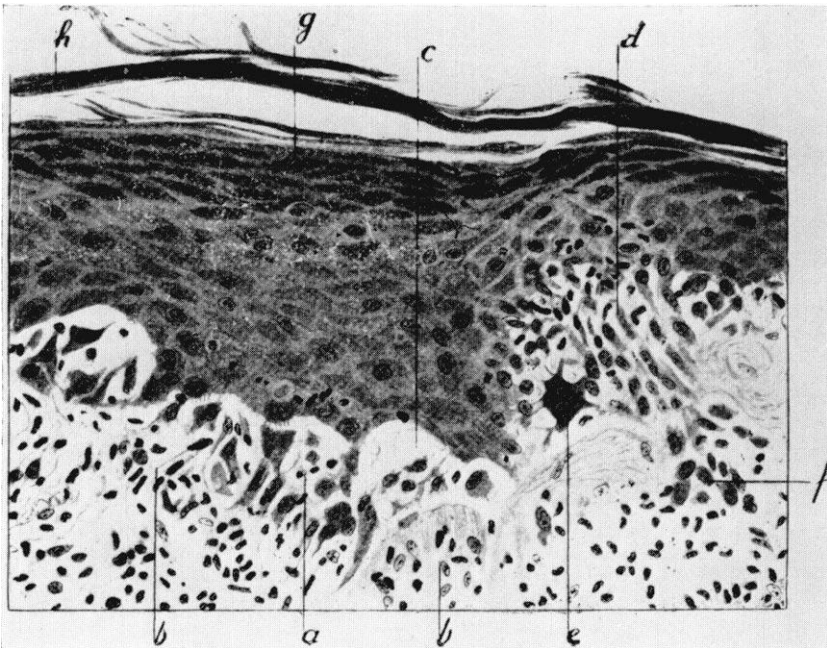


FIG. 4. Copy of Fig. 9 from Sabouraud's article. See Reference #9

the course in molluscum contagiosum caused by a known high-molecular virus. Cell changes of this type with (a) enlarged nucleoli containing nucleoproteins in high concentrations, (b) an increased concentration of nucleoproteins in the cytoplasm, and (c) total nuclear pyknosis and a high nucleoprotein concentration in the entire cytoplasm do not occur in other known pathologic conditions in the epithelium of the skin except in those caused by virus infections (with the exception of certain carcinomas originating from the stratified squamous epithelium).

In carcinomas of the skin, individual cell keratinization may mimic Sabouraud colloid bodies in lichen planus cells, but may be differentiated from the cancer cells, the former tending to migrate downward and not demonstrating other dyskeratotic changes as in carcinoma.

Lever (3c) stated that not infrequently does one observe in the lower-most epidermis and occasionally also in the upper dermis, hyaline or colloid bodies that represent degeneration of epithelial cells (Gougerot and Civatte).

Thyresson and Moberger, however, considered the possibility that they are epithelial cells containing intra-cytoplasmic viral inclusion bodies. Against this assumption is the fact that the colloid bodies are Feulgen negative.

Lever (3d) wrote in 1961 that the Feulgen reaction results in red staining of desoxyribonucleic acid (DNA) that is present in nuclei and in many viral inclusion bodies. On the other hand, ribonucleic acid (RNA) which is present in nucleoli, cytoplasm and keratohyaline, does not accept stain. This reaction is important as a stain for viruses, since it often allows their differentiation from nucleoli and keratohyaline granules.

The author found that the Feulgen reaction for staining of desoxyribonucleic acid (DNA) was negative, thus essentially ruling out the eosinophilic bodies being due to a virus. The fact that these bodies tend to migrate towards the basal layer rather than upward also suggests that these are not due to dyskeratosis nor does their morphology indicate that they are.

In 1963, Robert Goltz and Anne-Marie Hult (12) reviewed the histochemical nature of the colloidal bodies in lichen planus, and ruled out the possibility of these eosinophilic bodies be-

ing of viral nature or dyskeratotic cells, concluding that they are simply degenerated epidermal cells.

SUMMARY

The histology of lichen planus has been reviewed.

A histopathologic study of 100 biopsy specimens from proven cases of lichen planus may be summarized as follows:

1. The stratum corneum usually does not show parakeratosis.
2. There is usually beading of the granular layer.
3. The epidermis may be atrophic, normal, or moderately hypertrophic.
4. There is usually some liquefaction degeneration at the basal layer. At times this results in the formation of vesicles (Max Joseph spaces) at the dermal-epidermal border.
5. There is usually a characteristic well-defined band-like infiltrate below the basal layer.
6. The infiltrate extends slightly into the epidermis.
7. The infiltrate, although composed principally of small mononuclear cells (lymphocytes), may contain a variable number of epithelioid cells, and occasionally plasma cells and fibroblasts.
8. Eosinophilic degeneration in cells in the epidermis was observed in thirty-seven percent of the biopsy specimens studied. These changes may be of viral origin or may represent early and abnormal keratinization or degeneration. They warrant further investigation.

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