Histopathological Spectrum of Spongiotic Dermatitis from a Tertiary Care Centre

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ABSTRACT

BACKGROUND
Spongiotic dermatitis is a common diagnosis in routine dermatopathology practice. Clinically it includes eczema and its clinicopathological variants. The main purpose of a biopsy in such cases is to come to a precise diagnosis. We wanted to study the different histopathological features commonly seen in spongiotic dermatitis.

METHODS
This is a cross sectional study conducted at a Government Medical College in Kerala, South India. All lesions reported as cases belonging to the category of spongiotic dermatitis during the one-year period were included in the study. Patients who presented with an established diagnosis of spongiotic dermatitis were excluded from the study. The study included 41 skin biopsies.

RESULTS
The age distribution pattern revealed that the highest percentage was in the 10 - 20 years age group (21.95 %) with a male preponderance (68.29 %). Small plaque parapsoriasis was the most common lesion (24 %) encountered in the study.

CONCLUSIONS
Some of the histopathological features are specific and characteristic for each entity like small plaque parapsoriasis, pityriasis rosea and erythema annulare centrifugum whereas some features overlap in lesions like irritant contact dermatitis and photoallergic contact dermatitis. Therefore, clinical history combined with microscopic features will help us render a precise diagnosis.

KEYWORDS
Spongiotic, Dermatitis, Inflammatory, Histopathological

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BACKGROUND

Spongiotic dermatitis (SD) is one of the commonest inflammatory dermatoses encountered in day to day dermatopathology practice. Spongiosis is defined as intercellular oedema between keratinocytes, sometimes resulting in vesicle formation. From a clinical standpoint, they include eczema which is the prototype and its variants. Researchers have proposed the idea that damage to the transmembrane proteins that help in cell to cell adhesion (cadherins) is responsible for the spongiosis and this damage is brought about by keratinocyte apoptosis induced by T-cells.[1,2] Labelling an inflammatory dermatosis as spongiotic dermatitis is not enough and does not help in any way, as the spongiotic nature of the dermatitis may be detected at the clinical level.[3] The main purpose of a biopsy in such cases is to come to a precise diagnosis. A precise diagnosis is the one that most closely correlates with the clinical picture and helps the clinician in giving the most appropriate treatment to the patient. Appropriate histologic diagnosis can be made by emphasizing certain key observations that have value in identifying particular diseases. Despite the incremental advances of molecular techniques in diagnosis, morphology is still the basis of diagnosis for most inflammatory dermatoses.[4] It is very crucial to understand that histopathology has its own fair share of limitations and therefore not all lesions can be rendered a precise histopathologic diagnosis.

The problem that we encounter in the diagnosis of inflammatory dermatoses is the fact that, more often than not, the histopathologic features are very non-specific or at the most only suggestive of a specific diagnosis. However, the histopathology can contribute by ruling out an important diagnosis even though an exact diagnosis cannot be made. In the real world of clinical medicine, a histologic description and differential diagnosis for a difficult case is often superior to a single precise diagnosis, that may be correct or maybe misleading if you closely look at the clinicopathological picture of a particular patient.[4] lichenoid reaction, psoriasiform reaction, spongiotic reaction, vesiculobullous reaction, granulomatous reaction and vasculopathy reaction are the six major reaction patterns in inflammatory dermatopathology. Here, we deal with spongiotic reaction pattern. It focuses on the histopathological features of spongiotic reaction pattern, which may help the pathologist to narrow down his / her differential diagnoses.

METHODS

It is a cross-sectional study, conducted at the Department of Pathology of a Government Medical College in South India, from, after getting institutional ethical committee clearance. All lesions diagnosed as cases belonging to the category of spongiotic dermatitis (41 cases) during the period of one year from January 2008 to December 2008 were included in the study. Patients who presented with an established diagnosis of spongiotic dermatitis were excluded from the study. The diagnosis was made on the basis of clinical features and histopathology. The specimens were fixed in 10 % formaldehyde. Multiple sections were taken and stained with hematoxylin and eosin. The slides were evaluated for the different histopathological features. The different microscopic features were compared between the cases which came under the category of spongiotic dermatitis.

RESULTS

During the study period, 41 cases of spongiotic dermatitis were received. Out of 41 cases, 68.29 % were males (N = 28) and 31.7 % were females (N = 13). The male to female ratio in our study was 2.15:1. The age distribution of 41 cases of spongiotic dermatitis is depicted in Table 1. The youngest patient in our study was 12 years old and the oldest one was 69 years old. The condition was most common in the second decade 21.95 % (N = 9).

The lesions diagnosed as spongiotic dermatitis were further categorized into different subtypes based on microscopic features. The distribution of lesions in spongiotic dermatitis according to the histological types is depicted in Table 2. Histologic findings observed in different cases is shown in Figures 1a, 1b, 1c and 1d. Out of the 41 cases, maximum number of lesions (N = 10) belonged to the group of small plaque parapsoriasis (24 %). All the lesions showed orthokeratosis, focal parakeratosis, mild spongiosis with exocytosis of mononuclear cells and perivascular infiltrate of mononuclear cells in upper dermis. One case showed acanthosis in addition to other features.

Spongiotic dermatitis without any specific qualifier constituted the next group with equal number of cases (24 %). Five out of ten cases were in the acute phase and the other five were in the subacute phase. All cases of acute spongiotic dermatitis showed orthokeratosis, spongiotic vesicle, exocytosis of mononuclear cells with dilated blood vessels and perivascular mononuclear infiltrate in upper dermis. The cases of subacute spongiotic dermatitis showed acanthosis in addition to the above features but were devoid of spongiotic vesiculation.

Five cases belonged to the category of exfoliative dermatitis (12 %). All the cases showed orthokeratosis, focal parakeratosis, spongiosis, lymphocytic exocytosis and mild acanthosis. Dermis showed perivascular infiltrate of mononuclear cells.

Five cases belonged to the category of photoallergic contact dermatitis (12 %). All the cases showed orthokeratosis, spongiosis and exocytosis of mononuclear cells. One case also showed neutrophilic exocytosis. Papillary dermis showed perivascular infiltrate of mononuclear cells.
Four cases belonged to the category of pityriasis rosea (9 %). All the cases showed orthokeratosis, focal parakeratosis, underlying spongiosis and exocytosis of mononuclear cells. Papillary dermis showed red blood cells RBC and perivascular infiltrate of mononuclear cells. Two cases showed hyperkeratosis and one case showed acanthosis.

There were three cases of irritant contact dermatitis (7 %). All three cases showed vesiculation with lymphocytic exocytosis in two cases and mixed neutrophilic and

lymphocytic infiltrate in one case. Dermis showed perivascular and interstitial lymphocytic infiltration.

There were three cases of seborrhoeic dermatitis. All three cases showed orthokeratosis, focal parakeratosis, moderate acanthosis, mild spongiosis and focal lymphocytic exocytosis. Dermis showed perivascular infiltrate of mononuclear cells.

Age	Number of Cases	Percentage
10 - 20 years	9	21.95
21 - 30 years	5	12.19
31 - 40 years	6	14.63
41 - 50 years	8	19.51
51 - 60 years	7	17.07
61 - 70 years	6	14.63
Total	**41**	**100**

Table 1. Distribution of Cases According to Age

Histopathological Diagnosis	Number of Cases	Percentage
Parapsoriasis	10	24.39
Spongiotic dermatitis	10	24.39
Exfoliative dermatitis	5	12.19
Photoallergic contact dermatitis	5	12.19
Pityriasis rosea	4	09.75
Irritant contact dermatitis	3	07.33
Seborrheic dermatitis	3	07.33
Erythema annulare centrifugum	1	02.43
Total	**41**	**100**

Table 2. Distribution of Cases According to Histologic Subtypes of Spongiotic Dermatitis

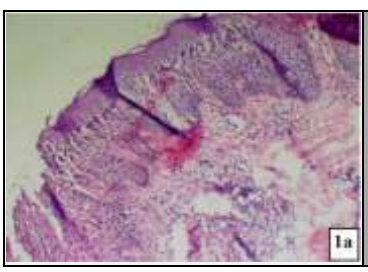

Figure 1a. Small Plaque Parapsoriasis Showing Mild Spongiosis (H&E Stain, X10).

Figure 1b. Spongiotic Dermatitis Showing a Vesicle (H&E Stain, X10).

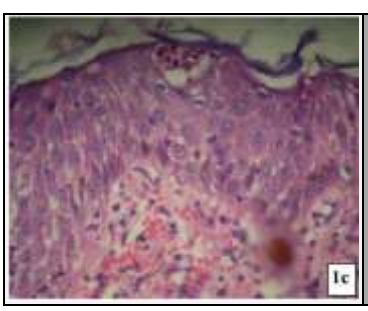

Figure 1c. Pityriasis Rosea Showing Extravasated RBC in Papillary Dermis (H&E Stain, X40).

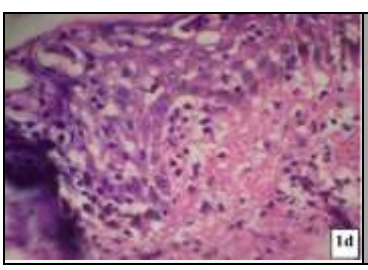

Figure 1d. Photoallergic Contact Dermatitis Showing Spongiosis and Lymphocytic Exocytosis (H&E Stain, X40).

One case showed features of erythema annulare centrifugum with focal spongiosis, vesiculation and neutrophilic exocytosis. Dermis showed superficial perivascular infiltrate of lymphocytes with a coat sleeve appearance.

DISCUSSION

More often than not, clinicians get pathology reports stating a spongiotic dermatitis with no other cue in the form of a differential diagnosis. There may be a few reasons for this phenomenon. Some of them maybe a result of the nonspecific nature of the reaction pattern attributed to sampling error and / or lesional evolution. Additionally, some conditions are so identical that to pick one without any mention of the other, entirely on a histologic basis, may unintentionally misguide the clinician.[5,6] Notwithstanding the often remarkable histologic similarities among the various spongiotic dermatitis, there are many ultra-fine yet perceivable features that may give out clues to the underlying pathologic phenomenon. Unfortunately, in some cases due to reasons such as sampling error or insufficient lesional evolution, the pathologist has no other option but to give a broad diagnosis of spongiotic dermatitis.

The maximum number of cases showed features of small plaque parapsoriasis. No predilection for any age group or sex were noted in the present study. By light microscopy, focal epidermal involvement consisting of slight spongiosis, minimal exocytosis of lymphocytes, mild acanthosis and parakeratosis were seen. Elongated mounds of parakeratosis with collection of plasma above a basket weave cornified layer is a characteristic finding.[7] It was not seen in any of the cases of this study. Sine B et al. have stated that it is a benign disorder without the potential for transformation into mycosis fungoides.[8]

There were an equal number of cases belonging to the category of spongiotic dermatitis. According to Ernst E, often a diagnosis of spongiotic dermatitis consistent with the clinical diagnosis is as specific as one can be.[9] It may be acute, subacute or chronic. The process is dynamic and it may progress from acute to chronic phase. In acute spongiotic dermatitis, the epidermis is of normal thickness. The degree of spongiosis varies from slight to mark with intraepidermal vesiculation. In subacute spongiotic dermatitis, there is mild to moderate spongiosis occasionally with micro vesiculation. The epidermis is moderately acanthotic.

Exfoliative dermatitis is characterized clinically by generalised erythema and scaling. In a study conducted by Crowson AN et al., 74.4 % were associated with a pre-existing dermatosis, 14.6 % were idiopathic and 5.5 % were related to drugs and malignancy.[10] In the present study, all the cases showed features of spongiotic dermatitis with hyperkeratosis, parakeratosis, mild acanthosis and spongiosis with lymphocytic exocytosis.

Photoallergic contact dermatitis looks similar to acute allergic contact dermatitis showing moderate to severe spongiosis in some cases with vesiculation. One out of five cases studied showed vesiculation. It cannot be

differentiated from other spongiotic disorders by morphology alone. The diagnoses can only be given after clinical correlation.[11]

Pityriasis rosea is a self-limited dermatitis which is rarely taken for histopathologic examination.[12] Only atypical clinical variants require biopsy for confirmation. It shows other features of spongiotic dermatitis like focal parakeratosis, underlying spongiosis and exocytosis of mononuclear cells. A common feature is the presence of extravasated erythrocytes in the papillary dermis. It was noted in all the four cases studied. Elongated mounds of parakeratosis, sparse superficial perivascular lymphocytic infiltrate, minimal exocytosis and spongiosis are features of small plaque parapsoriasis which differentiate it from pityriasis rosea.[13]

The present study had three cases of irritant contact dermatitis (7 %). According to Lowell BA et al., routine histopathological changes do not reliably separate irritant from allergic contact dermatitis,[14] although necrosis, neutrophilic infiltration and acantholysis are more frequent in the former. In this study, all three cases showed blister formation with lymphocytic exocytosis. Mixed neutrophilic and lymphocytic exocytosis was noted in one case.

The features in seborrheic dermatitis are a combination of those observed in psoriasis and spongiotic dermatitis.[15] The present study had three cases. All the three cases showed focal parakeratosis, moderate acanthosis, mild spongiosis and focal lymphocytic exocytosis. Dermis showed perivascular infiltrate of mononuclear cells.

This study had a single case of erythema annulare centrifugum. It belongs to the family of gyrate erythemas.[16] Epidermis showed hyperkeratosis and a spongiotic blister composed of neutrophils. Dermis showed perivascular lymphocytic infiltrate in a coat sleeve like pattern with focal extravasation of erythrocytes. This lesion does not pose any problem in diagnosis as the clinical picture is characteristic.

CONCLUSIONS

Spongiotic dermatitis for the most part is insufficient to provide a precise diagnosis. Nevertheless, its presence in relation with concurrent epidermal and dermal changes frequently provides just enough evidence for a relatively accurate diagnosis. Considering this, an exhaustive understanding of a lesion's histologic profile will definitely help to augment communications with the clinician and therefore helps in providing a suitable clinical management to the patient.

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