

Erythema Papulosa Semicircularis Recidivans: A New Reactive Dermatitis?

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Background: Nine patients with recrudescent and centrifugally expanded papuloerythematous eruptions were observed in our outpatient department during the recent 8 years. The patients were all young and middle-aged men presenting with characteristic skin lesions and relapsing each year in the warm humid season. Such an observation has not yet been described in the English literature.

Objectives: The objective of this study was to describe the clinical characteristics and explore the possible etiologies of our cases. In addition, differential diagnosis with other common figurate erythemas was also reviewed and discussed.

Methods: In 5 of the patients, skin-prick testing was performed with common airborne and food allergens, and skin patch testing with the Chinese baseline series of contact allergens was performed, along with histopathologic examinations.

Results: The skin findings in our patients were conspicuous in their papular characteristics of the borders, semicircular arrangement, male predominance, and yearly crescendo of recurrence in warm seasons. Histopathologic examination showed superficial perivascular dermatitis, whereas skin-prick testing and patch testing showed negative results.

Conclusions: Although the etiology of our cases remains unclear at present, the clinical characteristics make them distinct from other well-described figurate erythemas characterized by annular erythematous lesions. We propose the term *erythema papulosa semicircularis recidivans* to depict a special form of recurrent papuloerythematous figurate erythema of unknown etiology.

FROM MAY 2002 to December 2010, 9 patients with similar cutaneous findings were seen in our outpatient department. These patients were young and middle-aged men presenting with a semicircular arrangement of papuloerythematous eruptions, which could expand centrifugally. The borders of the skin lesions consisted mainly of red papules on a light erythematous background that are obviously different from those of erythema annulare centrifugum (EAC). The skin rash usually appears at the beginning of summer, subsides spontaneously at the end of autumn, and recurs the next year at nearly the same seasonal time. This condition has not yet been described in the English literature and is tentatively designated here as *erythema papulosa*

semicircularis recidivans. We hereby report its clinical manifestations and the preliminary results of the investigation of these patients.

MATERIALS AND METHODS

Subjects and History

Detailed medical histories taken from the 9 enrolled patients included age, disease course, time of diagnosis, locations of eruptions, aggravating factors, and travel history.

Allergy Studies

Skin-prick testing with a common airborne and food allergy series (Allergopharma Skin Prick Testing Kits; Allergopharma, Reinbek, Germany) and patch testing with the Chinese baseline series of contact allergens (Minshai patch test kits, Beijing Medical University, China) were performed in 5 of the patients according to the manufacturers' manuals.¹

Histopathology and Immunohistochemistry

Tissue samples from the edges of skin lesions on the previously mentioned 5 patients were examined. All specimens were fixed in 4% formalin, processed routinely, and embedded in paraffin. For immunohistochemical analysis, sections were stained with anti-CD4

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TABLE 1. Clinical Profiles and Laboratory Data of the Affected Patients

No.	Sex	Age, y	Course, y	Year of Diagnosis	Location of Lesions	Aggravating Factors	Patch-Test Result	Skin-Prick-Test Result	Histopathology Findings
1	M	39	3	2002	Flank, thighs	None	ND	ND	ND
2	M	37	2	2003	Flank, neck, thighs	Sweat	Negative	Negative	Perivascular dermatitis
3	M	30	3	2003	Flank	None	ND	ND	ND
4	M	28	3	2003	Back	Sweat, spicy food	ND	ND	ND
5	M	36	2	2003	Flank	None	ND	ND	ND
6	M	34	5	2008	Flank, anterior trunk	Sweat	Negative	Negative	Perivascular dermatitis
7	M	24	2	2010	Flank, anterior trunk	Hot drinks, beer, sweat	Negative	Negative	Perivascular dermatitis
8	M	35	3	2010	Back	Sweat, spicy food	Negative	Negative	Perivascular dermatitis
9	M	39	4	2010	Flank, anterior trunk, upper arms, thighs	Sweat, spicy food	Negative	Negative	Perivascular dermatitis

M indicates male; ND, test or study not done.

antibodies (clone OPD4 [Dako, Glostrup, Denmark]) and anti-CD8 antibodies (clone C8/144B [Dako]).

RESULTS

The skin manifestations and clinical data of all the affected patients are summarized in Table 1. All the patients were men between 24 and 39 years of age living in Chongqing or in Sichuan province and presented to our clinic with skin lesions that recurred on the trunk for 1 year or longer. According to the patients,

the skin eruptions usually appear first on the trunk at the beginning of summer, expand centrifugally with mild pruritus, and are often exacerbated after profuse sweating and eventually form papuloerythematous lesions in a semicircular arrangement. Topical corticosteroid creams relieve the pruritus to some extent but cannot impede the progression of the lesions, which involve mostly the whole chest, the flanks, or part of the cervical neck. The skin lesions and symptoms gradually disappear at the end of December, when hot weather has passed. However, similar signs



Figure 1. Characteristic clinical photographs of the reported patients; photographs A to I correspond to patients 1 to 9, respectively (Table 1). All the patients show papuloerythematous lesions in a semicircular arrangement in different truncal body regions; in 2 of the patients, the upper extremities also were involved.

and symptoms appear each year, the pruritus becomes obvious, and different body regions may be affected. The personal and family medical histories of these patients are irrelevant, and there was no known history of travel outside China. Findings of routine laboratory examinations (including complete blood count, autoimmune antibodies, and uroscopy) were unremarkable. Tests for human immunodeficiency virus infection and Hansen disease also yielded negative results. Physical examination at the time of presentation showed one to many large semicircular erythematous plaques ranging from 5×7 to 25×18 cm with central clearing but multiple bright red papules partially confluent and densely studded on the border. The predisposing areas were the flank (7 lesions), anterior trunk (3 lesions), and back (2 lesions), with involvement of the thighs in 2 of the patients (Fig. 1).

Skin-prick testing and patch testing showed unremarkable findings. Histopathology studies of the papules from the edges of the skin lesions showed mild hyperkeratosis, slight edema of the papillary dermis, and superficial sparse perivascular lymphocytic infiltration, indicating superficial perivascular dermatitis (Figs. 2A, B). In immunohistochemistry studies, the perivascular infiltrates were found to be composed of mixed $CD4^+$ and $CD8^+$ lymphocytes (Figs. 2C, D).

Management was mainly symptomatic and consisted of an oral antihistamine (loratadine, 5 mg/d), topical mometasone furoate

0.1% cream, and topical coal tar cream for 2 weeks. Each time, the skin lesions and symptoms gradually subsided under treatment. Long-term follow-up revealed yearly recurrence for the first 2 to 5 years, then a spontaneous resolution afterward.

DISCUSSION

The clinical manifestations of our cases are conspicuous in their papular characteristics, semicircular arrangement, male predominance, and yearly crescendo of recurrence in warm seasons, which make them distinct from other well-described figurate erythemas characterized by annular erythematous lesions, especially EAC and erythema migrans.

Two subtypes of EAC have so far been described: superficial EAC and deep EAC. These “classic” types of EAC mostly appear with erythematous edematous borders and are without a sex or seasonal predilection. However, all of the patients discussed here are male and had red elevated papules at the edges of skin lesions, which usually started at the beginning of summer, subsided spontaneously at the end of autumn, and recurred in the next year at nearly the same seasonal time. The sizes of the eruptions in our cases were obviously much larger than those observed in typical EAC. Histopathology studies of EAC usually show focal parakeratosis and spongiosis in the epidermis, with perivascular lymphocytic infiltrates around the

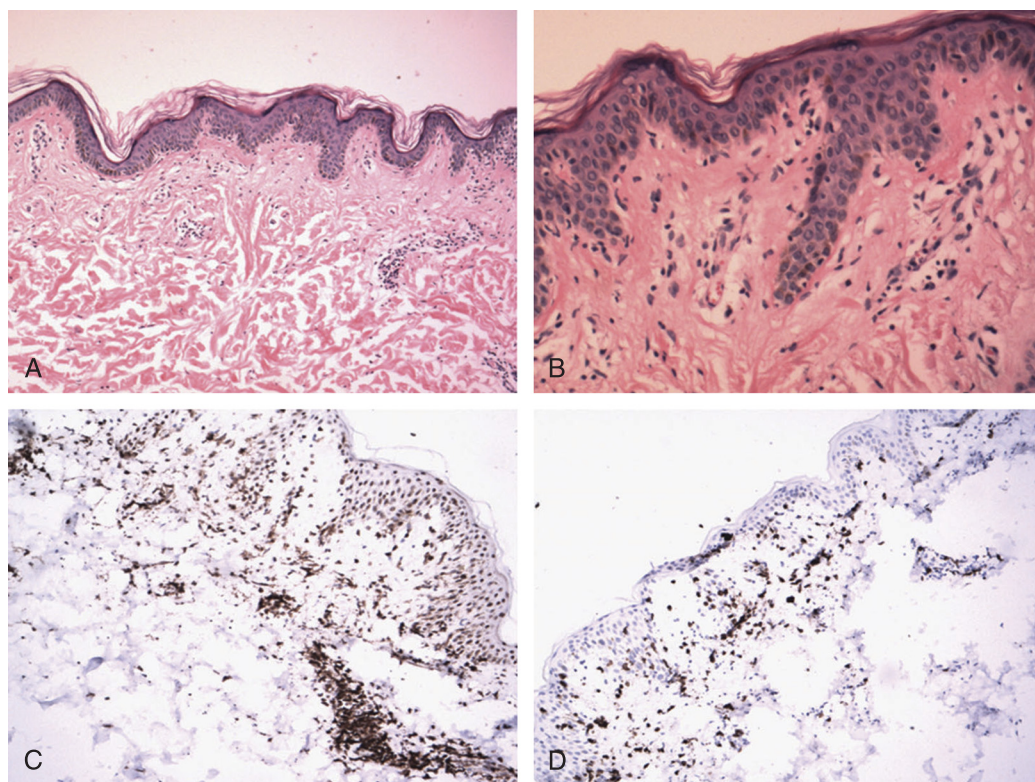


Figure 2. Histopathology studies of papules from the edges of the eruptions (images A and B correspond to cases 2 and 9, respectively), showing mild hyperkeratosis, slight edema of the papillary dermis, and superficial sparse perivascular lymphocytic infiltration (hematoxylin-eosin staining, original magnification $\times 40$). C and D, Immunostaining shows that the perivascular infiltrates are composed of mixed $CD4^+$ lymphocytes (C) and $CD8^+$ lymphocytes (D) (immunohistochemical staining, original magnification $\times 40$).

blood vessels in a sleeve-like arrangement in the superficial dermis. These findings are slightly different from the findings in our cases. In view of these differences, it appears less appropriate to regard our cases as EAC. On the other hand, studies to clarify the differences in immunophenotypic prototype of the infiltrated lymphocytes among the various figurate erythemas are lacking, and the recurrent nature and nonspecific histological findings in our cases may make a clear distinction from certain specific variants of EAC difficult, such as a papular form of EAC. However, a papular form of EAC has not yet been described in the literature or in major dermatology textbooks.²⁻⁸

Erythema migrans associated with Lyme disease, which usually presents with expanding annular erythema or plaque and a peripheral erythematous border, is clinically another important differential diagnosis. Although the detection of anti-*Borrelia* antibodies has not been carried out in our cases, the living and travel history of our patients, their clinical features, and the fact that Chongqing metropolis and Sichuan province are not endemic areas of Lyme disease all make the diagnosis very unlikely.^{9,10}

On the basis of clinical history, skin manifestations, laboratory findings, and histopathology, other differential diagnoses of figurate erythema can be excluded with little difficulty; these include annular urticaria, granuloma annulare, erythema gyratum repens, subacute cutaneous lupus erythematosus, annular erythema of Sjögren syndrome, secondary syphilis, pityriasis rosea, and erythema marginatum. Moreover, the arthropod bite reactions most commonly seen in our clinic have totally different skin presentations in which papular urticaria appears sporadically as urticarial papular lesions, and *Paederus* dermatitis frequently manifests with linear edematous erythema occasionally showing blisters and pustules. Lesions of papular pityriasis rosea or papular erythema annulare are usually smaller and have a different distribution as compared with lesions observed in our cases.

From an etiologic viewpoint, miliaria rubra occurs often with exposure to a hot environment and with excessive sweating, but the distribution pattern of lesions and the prolonged course in our patients do not support the diagnosis.³ On the other hand, the marked exacerbation of skin lesions with pruritus when there is

excessive perspiration may suggest a special form of dyshidrotic eczema occurring on the trunk. Alternatively, this disease may also represent a special hypersensitivity reaction to an indeterminate substance, such as the sweat itself or a food allergen in the sweat.

CONCLUSIONS

We have described a special form of recurrent figurate erythema of unknown etiology in 9 Chinese male patients, for which we suggest the term *erythema papulosa semicircularis recidivans*. Further studies are required to elucidate its potential mechanisms and significance.

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