

An Exanthem with An Annular Pattern in a 2-year-old Girl

Quiz

A 2-year-old Chinese girl was seen in clinic with an erythematous annular itchy rash which began on the thighs and had spread to the trunk and hands. The parent's concern was the rash's duration and association with 2 episodes of fever. The girl was an only child with a family history of atopy (her mother suffers from asthma and her first degree paternal aunt from eczema) but with no past medical history.

The clinical course is shown in Table 1. At onset of the eruption, the child was systemically well. After two febrile episodes, the child was well at 8 weeks and all rashes had resolved.

Table 1. Clinical course of the patient

Day 1	Rash appeared
Day 24	Fever 39.4°C for 1 week
Day 32	Fever subsides
Day 39	Fever 38.4°C for 3 days
Day 41	Fever subsides
Day 56	Rashes have resolved

On examination, a generalised maculopapular rash was observed over her trunk and limbs (Fig. 1) which was associated with confluent, non-scaly, erythematous annular plaques over the posterior thighs (Fig. 2). There was no joint pain, cervical lymphadenopathy, desquamation or strawberry tongue.

A full blood count on day 24 revealed a lymphocytosis; other indices (liver enzymes, CD4, CD8, CD3, Ig G/M/A/D/E) were normal. The anti-nuclear antibody and extractable nuclear antibody levels were not raised. Histological analysis of a biopsy over an annular plaque on the posterior left thigh showed superficial and deep perivascular and perieccrine lymphocytic infiltration. The patient was treated symptomatically with antihistamines and emollients and all the rashes resolved after 8 weeks.

What is your diagnosis?

- a) Urticaria
- b) Erythema annulare centrifugum
- c) Tinea corporis
- d) Atypical viral exanthem
- e) Granuloma annulare

Diagnosis: Atypical viral exanthem with an annular pattern

Discussion

The morphology of the rashes in our patient was primarily maculopapular/exanthematous. The most common cause of an exanthem in a child is a viral infection. An exanthematous drug eruption is another common cause and this was excluded in the history. Rare differential diagnoses of exanthem that have to be considered include acute lupus erythematosus, Still's disease, leukaemia, acute graft-versus-host disease and Kikuchi's disease. In our patient, there were no features to suggest these latter differential diagnoses.

This patient was systemically well when the florid rashes appeared. Together with her lymphocytosis and the resolution of the exanthema spontaneously, the likely aetiology is a viral exanthem. A diagnosis of erythema infectiosum was initially suspected but parvovirus B19 serology (IgM and IgG), tested late in the course of the disease, was negative. Parvovirus B19 infection can manifest as annular and gyrate urticarial plaques although the lacy reticulate rash and 'slapped cheeks' are much more typical.¹

Annular viral exanthems are extremely rare and very few have been reported. In 2006, 29 adult patients (collected over 5 years) were reported with an unknown viral exanthem which began as oedematous macules and progressed to a rash with an annular marginated morphology.² This study did not contain any paediatric patients however. Since their results do not correspond with any typical infectious exanthems or correlate with atypical presentations that have been described, the authors argue that the exanthema they report may be attributed to a new disease.

The diagnosis of viral exanthems relies on the combination of accurate rash morphology and distribution, coupled with



Fig. 1. Maculopapular rash over the trunk.



Fig. 2. Classic Annular erythemas.

knowledge of the exanthem’s duration, the patient’s clinical features and relevant history (medications, immunisations, contacts). For a significant proportion of atypical viral exanthems their aetiology cannot be defined. A study by Drago and colleagues which documented atypical exanthems in 112 out-patients demonstrated that 68% of the atypical exanthems could be attributed to a specific cause using morphology, clinical features and laboratory tests.³ Of these, 42% were of viral aetiology. However, annular exanthems (viral or any other kind) were not reported.³ Measles can present atypically with urticarial lesions and a recent case report describes annular plaques in Kawasaki’s disease.^{2,4} The patient’s clinical course and history does not fit with any of these diagnoses however.

In the approach to a rash of annular configuration, one should recognise if the epidermis is involved in the pathologic process. The absence of scaling and epidermal changes in this case made tinea corporis and subacute lupus erythematosus highly unlikely. When the inflammation is primarily confined to the dermis, differential diagnoses include the 4 classic erythemas (Table 2) and granuloma annulare. Annular lesions in tuberculoid leprosy and sarcoidosis are not typically extensive (unlike the case we describe). The purpose of the biopsy in our patient was to exclude the rarer causes of annular plaques, namely subacute cutaneous lupus erythematosus and granuloma annulare.

It is not unusual for urticarial plaques to have an annular

Table 2. The classic erythemas

Erythema	Morphology	Associations
Erythema marginatum	Maculopapular rash which evolves by peripheral spreading and central clearing to form an annular pattern—found on the trunk, arms and legs but rarely on the face.	Occurs in acute rheumatic fever.
Erythema chronicum migrans	Raised erythematous, slowly evolving plaque at the site of a tick bite.	Associated with <i>Borrelia burgdorferi</i> infection (Lyme disease).
Erythema annulare centrifugum	Gyrate erythema (either annular or acuate) which evolves by central clearing and peripheral spreading of the annulus.	Associated with drugs, infections, insect bites and malignancy.
Erythema gyratum repens	Rapidly evolving erythema, the pattern of which resembles wood grain.	Associated with systemic malignancy in adults. In children, erythema gyratum perstans (familial annular erythema) should be considered. This eruption shows similarities with erythema annulare centrifugum.

configuration. In our patient, the centre region of the plaques were completely flat (unlike in urticarial lesions) and the co-existing dermatosis on the other areas of the trunk and limbs were maculopapular rather than urticarial. Acute annular urticarial hypersensitivity syndrome, which manifests as an urticarial pruritic rash,⁵ is a differential diagnosis in the case. However, there were no associated angioedema and dermatographism which are features of this diagnosis.

In summary, we present a rare case with an annular exanthema, the clinical and laboratory features supporting a viral aetiology. We also use this case to illustrate the approach to exanthematous and annular dermatoses.

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