Immune complex-mediated cutaneous vasculitis in a scar – the importance of local anatomical factors

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Summary: A vasculitic rash developed on the legs and arms of a 47 year old woman. Similar vasculitic lesions also erupted in a scar sustained ten years previously. Circulating immune complexes consisting of IgG were detected by Clq binding. We discuss the factors involved in the localization of vasculitic lesions, and in particular stress the role of microvascular injury.

Introduction

Cutaneous vasculitis consists of a number of clinical syndromes in which the putative pathogenesis is the formation of circulating immune complexes and their deposition in small blood vessels with consequent inflammation and necrosis (Dambuyant & Thivolet, 1980; Cupps & Fauci, 1982).

The exact relationship between circulating and deposited immune complexes and the pathogenesis of the vasculitic process is still unclear (Cupps & Fauci, 1982) but a number of immunological, haemodynamic, anatomical, pharmacological and rheological factors are known to affect both the deposition of immune complexes and the localization of vasculitis (Greaves, 1980; Ryan, 1976; Ryan, 1979).

We report a case in which local anatomical factors appear to be important.

Case report

A 47 year old female Greek Cypriot was admitted with a painless vasculitic rash that had commenced ten days previously and had spread to involve the lower and upper parts of her legs and was starting to appear on her arms. The lesions were papular 0.5–1 cm across and were tender to palpation. There was pitting ankle oedema.

Ten years previously she had been involved in a road traffic accident which resulted in a scar on her right

forearm. This was dramatically outlined by vasculitic lesions (Figure 1).

Investigations revealed a normal haemoglobin and white cell count. The erythrocyte sedimentation rate was 79 mm/h. No cryoglobulins or cryofibrinogen were detected but immune complexes consisting of IgG were detected by Clq binding. Immunoglobulin and complement levels were normal. There was microscopic haematuria but no proteinuria. Skin biopsy showed the typical features of a lymphocytic vasculitis with numerous lymphocytes in an inflammatory infiltrate extending through the dermis into the subcutaneous fat. Chest X-ray, serological, biochemical and microbiological tests were normal.

She was treated with bed rest and oral prednisolone 60 mg daily with rapid resolution of the rash and was discharged on a tailing dose of prednisolone. There was no recurrence at follow-up three months later.

Discussion

A number of factors influence the deposition of immune complexes in the vascular wall, including the intra-luminal pressure inside the capillary venule (which may account for the predilection of immune complex vasculitis for the skin of the legs), the concentration, composition, rate of deposition and rate of clearance of the immune complexes, complement, pharmacological factors, e.g. histamine and catecholamines, various rheological factors such as the effect of blood cooling in the skin causing increased blood viscosity (Greaves 1980; Ryan 1979).

Ryan (1976, 1979) believes that the 'vulnerability status' of the vessel determines the development of vasculitis rather than the mere presence of immune complexes. In his model, noxious substances are more

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Figure 1 Photograph of 6 cm (approx) scar on forearm outlined by vasculitic lesions.

likely to localize in blood vessels which have sustained microvascular injury with a consequent change in their structure. He predicts that vessels under 'stress' e.g. in areas of gravitational stasis such as the legs, and wounds and scars, are more likely to be affected by vasculitis. The former have been previously described and we have clearly demonstrated the existence of the latter.

The simultaneous appearance of vasculitic lesions in a scar in this patient with immune complex-mediated

cutaneous vasculitis strongly supports the view that local microanatomical structural changes are important in determining the localization of vasculitic lesions.

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