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Pathology of tick bites

E. Castelli,* V. Morello,† and R.M. Tomasino†

**Department of Dermatology of the University, †Institute of Pathology of the University, Palermo, Italy*

A retrospective histological and immunohistochemical study has been carried out on a series of 35, clinically documented, cases of tick bite reactions recorded in our departments. If the tick was still in site, the lesions – clinically erythematous and oozing plaques – were characterized by a blood-soaked, erythrocyte laden, spongiform appearance of the superficial dermis, which was peppered with a number of neutrophils, and centered by an abscess around the embedded mouth-parts. The same spongiform changes were seen in the vessels, whose walls showed a loose, multilayered proliferation of endothelial and perithelial cells, permeated with erythrocytes. The overlying epidermis was covered by a thick mound of welding cement. The ticks removed from the lesions belonged to the species *Rhipicephalus sanguineus* and *Ixodes ricinus*. A few weeks after the tick removal, the lesions showed noticeable edema of the superficial dermis and a perivascular, as well as, interstitial mixed infiltrate, rich in eosinophils. Endothelial swelling fibrinoid change and infiltration of the vessel walls from neutrophils were seen, while the epidermal changes ranged from spongiosis and ballooning to full thickness necrosis. In the erythema chronicum migrans-like cases observed, only mild, mainly lymphocytic, perivascular infiltrate with a few eosinophils was noticed. In long dated plaques and nodules, a top-heavy lympho-histiocytic and eosinophilic infiltrate fashioned two main pictures: a perivascular and interstitial, patchy or confluent pattern with diffuse edema of the superficial dermis, on the one hand, and a typical B-cell pseudolymphoma on the other. The latter was characterized by reactive lymphoid follicles with CD20+ and briskly Ki-67+ germinative centers, and well-developed CD3+ mantle zones. A number of eosinophils were present in the interfollicular areas. Granulomatous aggregates of epithelioid and giant multinucleated cells were focally observed in both the patterns. The vessels showed a conspicuous multilayered endothelial and perithelial proliferation with plump CD31+ and CD34+ endothelia, frequently resulting in occlusion of the lumen. In the older lesions, concentric perivascular fibroplasia and morpheiform changes of the collagen bundles were seen. In none of our patients were antibodies for Lyme disease detectable. The observed alterations seem to ensue, at least in part, from the complex interaction between the host's tissues and the tick saliva, which is now known to contain anti-hemostatic, anti-inflammatory and immunomodulatory molecules helping these arthropods to achieve heir blood meal.

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