

Fig 1.—Erythematous, violaceous nodules on left thigh (case 1).



Fig 2.—Focally ulcerated or crusted nodules on left thigh (case 2).

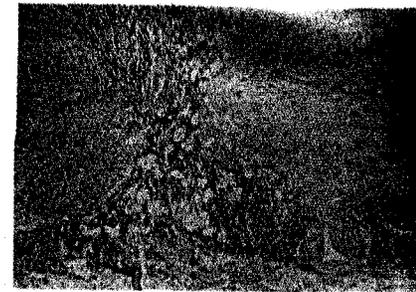


Fig 3.—Panniculitis concentrated at dermal-subcutaneous interface (hematoxylin-eosin, ×63).



Fig 4.—Inflammatory infiltrate in perivascular area and adjacent adipose tissue (hematoxylin-eosin, ×250).

sels showed thickening of their walls caused by endothelial swelling, intercellular edema, and intramural inflammatory cells. Erythrocytes seemed sludged in a few of the vessels, but fibrin was not seen in vascular lumina or walls. The configuration of affected vessels was most consistent with that of small veins and venules. In neurovascular bundles, an inflamed vein or venule was regularly identified adjacent to a small muscular artery or arteriole that was completely normal (Fig 5). All of these changes were found, to a lesser extent, at the deep margin of each specimen that, in the deepest specimen, was approximately 0.5 cm below the dermal-subcutaneous fat junction. Superficial capillaries and venules showed mural edema and a moderate perivascular mononuclear cell infiltrate.

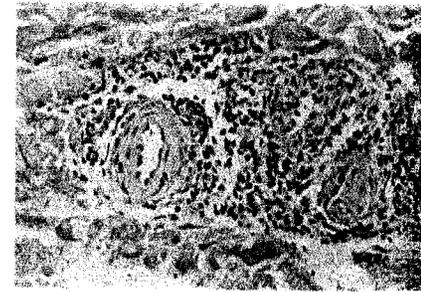


Fig 5.—Neurovascular bundle with inflamed vein situated between normal artery and nerve (hematoxylin-eosin, ×250).

cept for the cutaneous lesions, the results of the physical examination were normal. Studies for cryoglobulins and cryofibrinogens were negative, and serum protein immunoelectrophoresis results were within normal limits.

CASE 4.—A healthy 27-year-old female horse trainer worked with the patient described in case 3, performing the same equestrian activities and using the same type of riding garments. In February 1979, red, painful areas on the upper lateral portions of the thighs developed. She was seen in Winchester, Va, for evaluation.

There were several 1- to 2-cm, tender, red, edematous nodules, without ulceration, on the upper lateral aspects of the thighs. The lesions were surrounded by hyperpigmentation. Aside from the cutaneous lesions, the results of the physical examination were normal.

The histologic changes seen in biopsy specimens from each of the four patients were similar. There was an inflammatory reaction in adipose tissue that was most notable at the dermal-subcutaneous fat junction (Fig 3) and in the fat surrounding exocrine secretory coils and neurovascular plexuses. The infiltrate consisted of lymphocytes and neutrophils, with a sparse scattering of mast cells and foamy histiocytes. Small numbers of nuclear fragments were present. Eosinophils, plasma cells, and granulomas were absent. The infiltrate seemed to extend from a perivascular location into adjacent adipose tissue, where it formed narrow bands and small patches (Fig 4). Fat cells were ruptured, and small cystic spaces were formed. Zones of light, amphophilic, stringy material stained intensely with colloidal iron; that reaction was abolished by hyaluronidase. Blood ves-

COMMENT

In 1902, Hochsinger⁴ described several children, 4 to 10 years of age, in whom tender, red plaques in the submental areas developed after exposure to cold weather. The lesions resolved in two to three weeks. In only one instance were the cheeks involved. In 1941, Haxthausen⁵ described four preschool children and a 17-year-old girl in whom painful facial plaques developed several days after exposure to cold weather. All patients had involvement of the cheeks, and three had submental changes. The lesions resolved spontaneously and completely within a few weeks. Solomon and Beerman⁶ described a 28-year-old woman in whom recurrent, deep-seated, notably tender nodules developed on the cheeks, legs, and thighs after she was exposed to a 32- to 48-km/hr wind at -15°C while walking several blocks.⁶ The lesions reached their zenith at 72 hours, started to subside in one to two weeks, and left residual hyperpigmentation that cleared in a month. Application of ice to the skin of the patient for two minutes produced similar nodules that appeared in three to six hours, reached full development within 72 hours, and disappeared in one to three weeks.

Rotman⁷ reported cold panniculitis in two infants aged 5 and 8 months.

Redness and swelling of the cheeks developed within six to 24 hours after exposure to temperatures of -9 to -7°C . These changes evolved into warm red plaques within four days after exposure and subsided within two to five weeks, leaving hyperpigmentation in one case. Approximately half a day after a two-minute application of an ice cube to the volar aspect of the arm in each patient, an erythematous, indurated area was noted that continued to enlarge during the next few days. Results of studies of serum protein levels were normal in these patients, and cold agglutinins, cryofibrinogens, and cryoglobulins were absent. Lowe⁸ observed two children, aged 7 months and 3 years, with clinical and ice-cube-induced lesions that were similar to those described by Rotman.⁷

Popsicle panniculitis is closely related, if not identical, to cold panniculitis. Duncan et al⁹ observed a 6-month-old infant with indurated plaques in the cheeks that developed three days after contact with a popsicle held crosswise in the mouth. They studied a lesion induced in the patient by application of ice and found histologic changes similar to those observed in our cases. The abnormalities, studied at serial time intervals, were well developed at 72 hours and progressed somewhat for the next three days. Two other reports describe