Yellow Papules and Plaques on a Child

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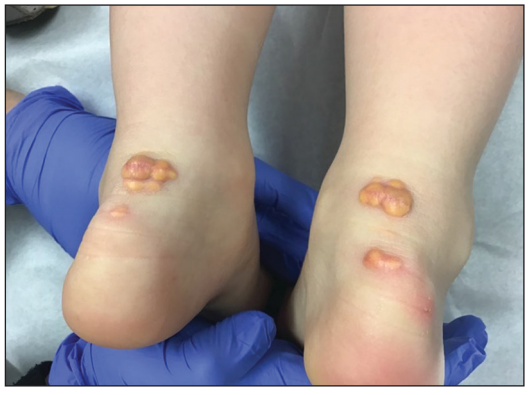
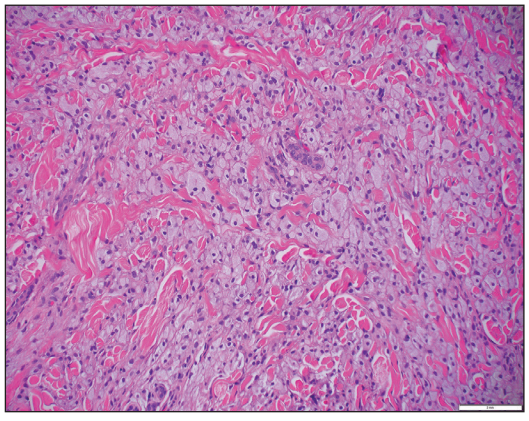


Yellow papules on the heels in a 3-year-old girl.

A 3-year-old girl presented with raised, firm, enlarging, asymptomatic, well-defined, subcutaneous papules, plaques, and nodules on the hands, knees, and posterior ankles of 1 year's duration. The patient's mother stated that the lesions began on the ankles (top), and she initially believed them to be due to friction from the child's shoes until the more recent involvement of the knees and hands. The patient's father, paternal grandfather, and paternal great-grandfather had a history of elevated cholesterol levels. A shave biopsy was performed (bottom).

THE BEST **DIAGNOSIS IS:**

a. juvenile xanthogranuloma
b. keloid scar
c. necrobiosis lipoidica diabeticorum
d. Rosai-Dorfman disease
e. tuberous xanthoma



H&E, original magnification ×200. Reference bar indicates 2 mm.

PLEASE TURN TO PAGE 268 FOR THE DIAGNOSIS

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The authors report no conflict of interest.

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THE **DIAGNOSIS:** Tuberous Xanthoma

The skin biopsy revealed a nodular collection of foam cells (quiz image [bottom]). Tuberous xanthoma was the most likely diagnosis based on the patient's history as well as the clinical and histologic findings. Tuberous xanthomas are flat or elevated nodules in the dermis and subcutaneous tissue, commonly occurring on the skin over the joints.[1] Smaller nodules and papules often are referred to as tuberoeruptive xanthomas and exist on a continuum with the larger tuberous xanthomas. All xanthomas appear histologically similar, with collections of foam cells present within the dermis.[2] Foam cells form when serum lipoproteins diffuse through capillary walls, deposit in the skin or tendons, and are scavenged by monocytes.[3] Tuberous xanthomas, along with tendinous, eruptive, and planar xanthomas, are the most likely to be associated with hyperlipidemia.[4] They may indicate an underlying disorder of lipid metabolism, such as familial hypercholesterolemia.[1,3] This is the most common cause of inheritable cardiovascular disease, with a prevalence of approximately 1:250.[2] Premature cardiovascular disease risk increases 2 to 4 times in patients with familial hypercholesterolemia and tendinous xanthomas,[1] illustrating that recognition of cutaneous lesions can lead to earlier diagnosis and prevention of patient morbidity and mortality.

Juvenile xanthogranuloma typically presents as smooth yellow papules or nodules on the head and neck, with a characteristic "setting-sun" appearance (ie, yellow center with an erythematous halo) on dermoscopy.[5] Histologically, juvenile xanthogranulomas are composed of foam cells and a mixed lymphohistiocytic infiltrate with eosinophils within the dermis. Giant cells with a ring of nuclei surrounded by cytoplasm containing lipid vacuoles (called Touton giant cells) are characteristic (Figure 1). In contrast to tuberous xanthomas, juvenile xanthogranulomas often present within the first year of life.[6]

Keloid scars are more prevalent in patients with skin of color. They are characterized by eosinophilic keloidal collagen with a whorled proliferation of fibroblasts on histology (Figure 2).[7] They occur spontaneously or at sites of injury and present as bluish-red or flesh-colored firm papules or nodules.[8] In our patient, keloid scars were an unlikely diagnosis due to the lack of trauma and the absence of keloidal collagen on histology.

Necrobiosis lipoidica diabeticorum typically presents as an erythematous, yellow-brown, circular plaque on the anterior lower leg in patients with diabetes mellitus; it rarely occurs in children.[9] Microscopy shows palisaded granulomas surrounding necrobiotic collagen arranged horizontally in a layer cake–like fashion (Figure 3).[9,10] The etiology of necrobiosis lipoidica diabeticorum currently is unknown, though immune complex deposition may contribute to its pathology. It has been associated with type 1 diabetes mellitus, though severity of the lesions is not associated with extent of glycemic control.[10]

Rosai-Dorfman disease is an uncommon disorder characterized by a proliferation of histiocytes that most often presents as bilateral cervical lymphadenopathy in children and young adults but rarely can present with cutaneous lesions when extranodal involvement is present.[11,12] The cutaneous form most commonly presents

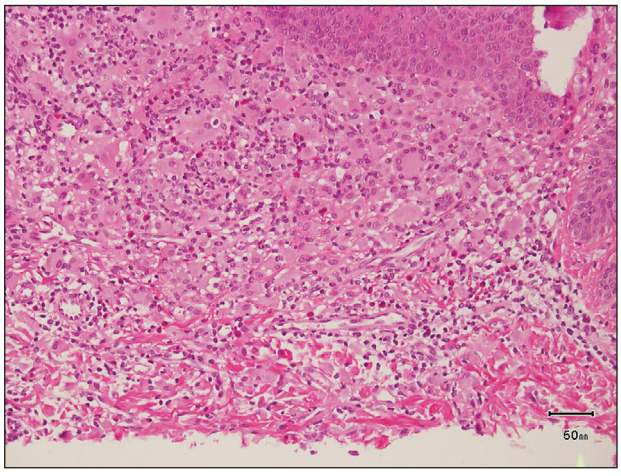

FIGURE 1. Juvenile xanthogranuloma. Mixed infiltrate with eosinophils, lipidized histiocytes, and Touton giant cells (H&E, original magnification ×200). Reference bar indicates 50 mm.

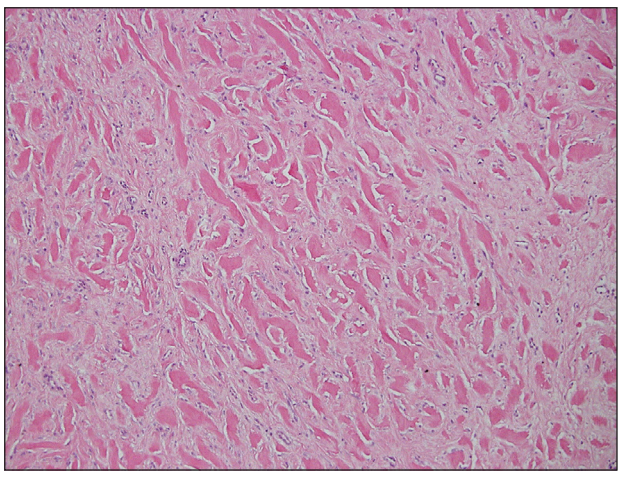

FIGURE 2. Keloid scar. Brightly eosinophilic keloidal collagen (H&E, original magnification ×400).

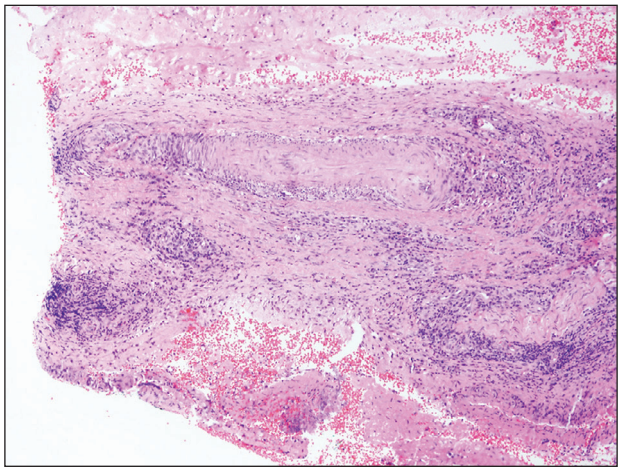

FIGURE 3. Necrobiosis lipoidica diabeticorum. Histiocytes arranged in horizontally oriented palisades (H&E, original magnification ×100).

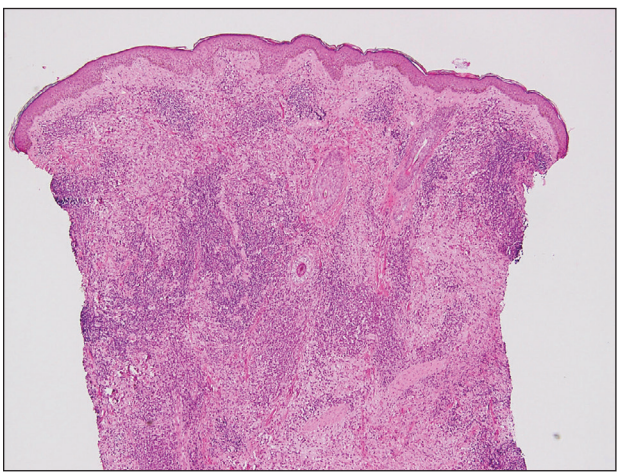

FIGURE 4. Rosai-Dorfman disease. Histiocytes and lymphocytic cells with a marbled, starry sky–like appearance (H&E, original magnification ×40).

as red papules or nodules. On histology, the lesions exhibit a nodular dermal proliferation of histiocytes and smaller lymphocytoid cells with a marbled or starry sky–like appearance on low power (Figure 4). On higher magnification, the characteristic finding of emperipolesis can be seen.[11] On immunohistochemistry, the histiocytes stain positively for CD68 and S-100. Although the pathogenesis currently is unknown, evidence of clonality indicates the disease may be related to a neoplastic process.[12]

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