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Atypical keratosis pilaris-like lesions in a patient with Bethlem myopathy

Abstract

Bethlem myopathy is a collagen VI-related myopathy. Collagen VI is primarily not only associated with the extracellular matrix of skeletal muscle, but is also found in the skin, blood vessels, and other organs. Dermatologic findings described for Bethlem myopathy include follicular hyperkeratosis and abnormal scar formation, although clinical and histopathologic photographs remain elusive in the literature. We present a case of atypical keratosis pilaris-like follicular lesions in a patient with Bethlem myopathy and provide histopathologic correlation to better characterize the development of skin lesions in this rare neuromuscular disease.

1 | BRIEF REPORT

A 15-year-old obese, non-ambulatory boy with a history of Bethlem myopathy presented with multiple non-healing lesions on his legs. No history of trauma or excoriations was found. He was initially followed by wound care and treated with cephalexin and triple antibiotic ointment with minimal improvement.

Physical examination revealed multiple, violaceous-to-brown, crusted 1- to 2 cm nodules on his lower legs. In addition, a background of many follicular-based, violaceous-to-brown 1- to 3 mm hyperkeratotic papules was found on the legs with mild alopecia in the affected areas (Figure 1). He had non-pitting edema of his lower extremities with subtle brawny discoloration.

Punch biopsies were taken of two lesions, one of a crusted nodule and one of a smaller follicular-based papule. The histopathology of the smaller lesion demonstrated perifollicular fibrosis and hemorrhage with follicular plugging, on the spectrum of keratosis pilaris (KP) (Figure 2A). The histopathology of the larger crusted lesion demonstrated a proliferation of focal slit-like blood vessels amidst dermal fibrosis and hemosiderosis, with immunohistochemistry demonstrating negative LANA (HHV8) and ERG labeling of endothelial cell nuclei and positive CD31 staining of the endothelium (Figure 2B-D). This was felt to be consistent with a reactive acroangiodermatitis-like fibrosing reaction secondary to follicular rupture. Additionally, tissue culture was performed from a larger crusted nodule for bacteria, fungus, and atypical mycobacterium, and resulted only with less than 1+ *Corynebacterium* species, which was thought to be a contaminant. Vitamin A and C levels were normal. The patient subsequently spontaneously developed multiple, similar, new ulcerated, and crusted nodules arising from the smaller follicular-based papules.

2 | DISCUSSION

Bethlem myopathy is a collagen VI-related disorder, characterized by progressive proximal muscle weakness and primarily distal joint contractures.[1] Collagen VI is an extracellular matrix protein critical in maintaining the integrity and function of muscles and the skin. Genetic mutation of collagen VI and collagen VI-related myopathies has been associated with follicular hyperkeratosis and abnormal scar formation.[2]The differential diagnosis of our patient's lesions included infection, namely deep fungal or atypical mycobacterial infection, vitamin deficiency, cutaneous vasculitis, and perforating dermatosis. With clinicopathologic correlation, it was concluded that our patient had follicular hyperkeratosis with an atypical KP-like appearance, as well as nodular lesions with hemorrhage and

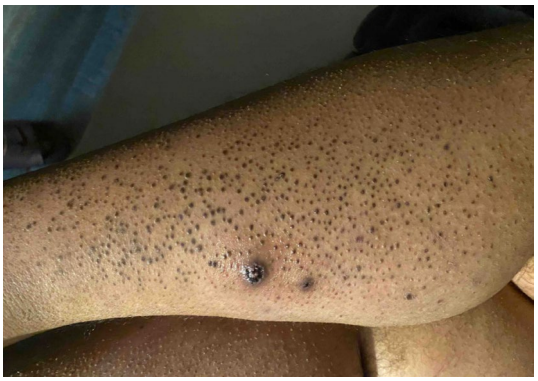

FIGURE 1 Lower leg with violaceous-to-brown, crusted nodules with a background of follicular-based, violaceous-to-brown 1- to 3 mm hyperkeratotic papules on the legs with mild alopecia of the affected areas

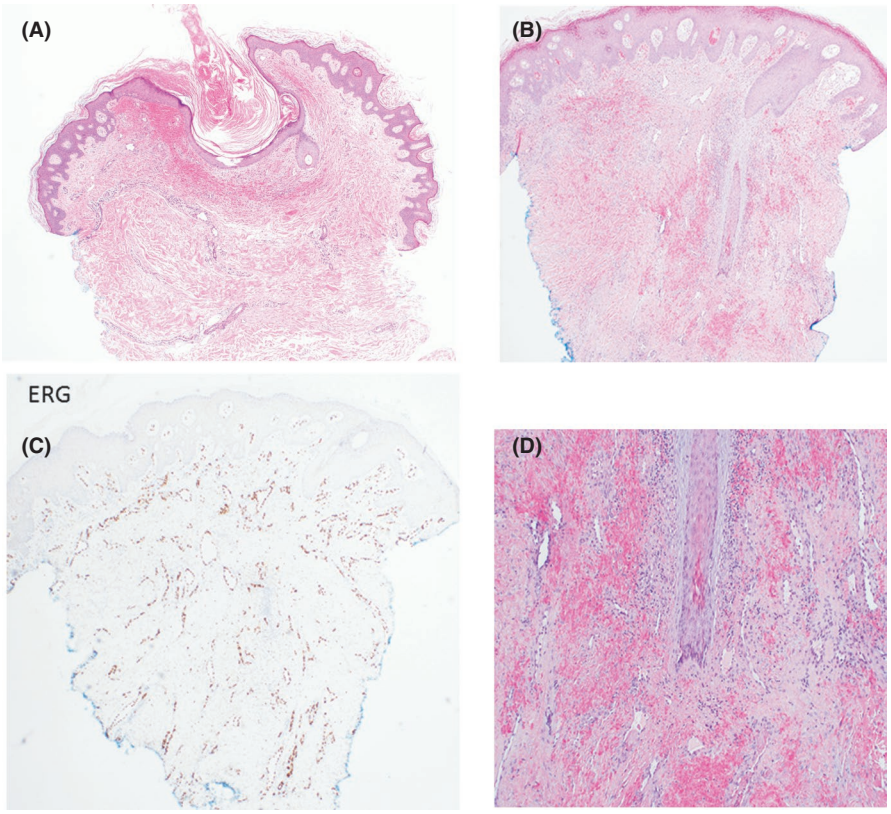

FIGURE 2 A. Histopathology (40x) of smaller perifollicular hyperkeratotic papule revealing epidermal hyperkeratosis and a keratin plug in the hair follicle. B-D: Histopathology of larger crusted nodule. B: Hematoxylin and eosin (H&E, 40x) staining of the larger crusted lesion. C: Immunohistochemistry (40x) demonstrated positive staining of CD31 of endothelial cells. D: H&E stain (100x) of the larger crusted lesion, demonstrating a proliferation of focal slit-like blood vessels amidst dermal fibrosis and hemosiderosis

fibrosis. The latter may reflect inflammation secondary to follicular rupture of the atypical KP-like lesions with acroangiodermatitis-like features, possibly due to the predilection for stasis-like alteration in the lower extremities secondary to muscle atrophy and the patient's underlying Bethlem myopathy. Acroangiodermatitis is a benign angioproliferative disorder typically of the lower extremities that is seen in chronic venous insufficiency, paralyzed legs, and amputations. It is interesting to note that collagen VI chains are found around blood vessels, which may possibly play a role in the pathogenesis of such lesions.[3]

While KP-like lesions are well described in the Bethlem myopathy literature, the etiology has not been elucidated and sparse clinical or microscopic photographs are found available.[4,5] The atypical crusted, nodular lesions arising from the KP-like lesions in our patient have not yet been described in literature. We postulate that the histopathologic finding of a reactive acroangiodermatitis-like fibrosing reaction may reflect predisposition to microvascular disease in the setting of a non-ambulatory patient with a collagen IV-related myopathy and stasis.

We recommended liberal moisturization and keratolytics and wound care for the non-healing lesions, including aggressive management of venous stasis. The patient, however, has continued to spontaneously develop new crusted ulcerations from the pre-existing KP-like papules.

KEYWORDS

Bethlem myopathy, collagen diseases, connective tissue disorders, muscular dystrophies, skin signs of systemic disease

CONFLICT OF INTEREST

All authors have no conflicts of interest.

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