

Case and Review

Morphea as Part of the Dermatological Manifestation of Celiac Disease: Case Presentation and Review of the Literature

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Keywords

Celiac disease · Morphea · Localized scleroderma · Dermatopathology · Case report

Abstract

Celiac disease is an immune-mediated disease, affecting multiple systems and organs including several dermatological conditions. Morphea, or localized scleroderma, is also an immune-mediated condition, in which an association with celiac disease has not thus far been recognized. We present an interesting case report of a 10-year-old child with a recent diagnosis of celiac disease presenting with morphea. Following treatment and adherence to a gluten-free diet, the morphea rapidly resolved. We suggest a possible relationship between the two entities and give a brief review of the relevant literature. We suggest that morphea might be one of the many dermatological manifestations of celiac disease, with possible implications for the need to screen patients with morphea for celiac disease.

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Introduction

Celiac disease (CD) is a chronic immune-mediated enteropathy triggered by the ingestion of the gliadin fraction of gluten in genetically susceptible individuals. CD patients have an increased risk of developing a number of skin manifestations and autoimmune diseases. Dermatologists should be aware of the various mucocutaneous manifestations of CD, so as to initiate appropriate screening investigations where indicated. Mucocutaneous conditions that can be associated with CD have been classified into two main etiological groups: autoimmune/immunologically mediated and conditions that result from the complications of CD [1]. Among the CD-associated immune-mediated dermatological conditions are dermatitis herpetiformis [2], cutaneous vasculitis [3], erythema elevatum diutinum [4], chronic urticaria [5], alopecia areata [6], and psoriasis [7], while other skin manifestations may result from mineral deficiencies, such as iron, zinc, vitamin B12, and folic acid, due to untreated CD [8, 9].

We present a case of co-existence of CD and morphea with complete resolution of both conditions following implementation of a gluten-free diet (GFD).

Case Presentation

A 10-year-old girl was referred to our gastroenterology clinic due to positive celiac serology after having presented to her primary care physician with a few months of abdominal pain associated with nausea, vomiting, and occasional headache. In addition, she complained of painful white markings on her lower and middle back. She denied shortness of breath, color changes of her palms and feet, difficulty swallowing, or any other complaints. Physical examination demonstrated the aforementioned skin findings on her lower-mid back, where a tender whitish-ivory atrophic plaque approximately 10 × 3 cm, sensitive to touch was seen (Fig. 1); there were no other pertinent findings. Diagnostic laboratory results were as follows: anti-tissue transglutaminase immunoglobulin A (anti-tTG IgA) antibody titers were 49 U/mL (normal <3) and anti-endomysial antibodies titers above 1:5. Complete blood count, thyroid-stimulating hormone, and C-reactive protein were within normal range. The parents preferred the no-biopsy approach; therefore, gastroscopy and small bowel biopsy were not performed, and a GFD was initiated.

A punch biopsy from the lesion was consistent with morphea (Fig. 2). Further workup to rule out systemic involvement included a normal echocardiogram and negative rheumatoid serology, including rheumatoid factor, antinuclear antibodies, and anti-Scl-70 antibodies. Her anti-tTG levels normalized with a GFD.

She was treated topically with a combination ointment containing betamethasone and calcipotriol for 4 weeks with marked improvement in consistency of the lesions, whereupon she was switched to topical mometasone furoate ointment and later to an emollient.

The patient decided to stop all topical steroids on her own accord 2 months after her diagnosis and short of some mild pruritus remained asymptomatic. At the last follow-up 2 years into the diagnosis, the patient had been adherent to a GFD and remained with negative celiac serology. No major change nor spreading of the skin lesions was observed, and the pruritus resolved without any systemic or local medications.

Discussion

Reports of CD being associated with multiple forms of skin conditions are protean [1]; however, strong evidence of a skin condition being directly related to CD exists only with dermatitis herpetiformis [2]. While other conditions have been found to occur at a higher frequency with CD, these have at best sporadic case reports implying an association [10]. One skin manifestation that has scarcely been reported to be associated with CD is morphea.

Morphea is considered a form of localized scleroderma (LSc) and includes a group of disorders whose manifestations are confined to the skin and subdermal tissues and, with some exceptions, do not affect internal organs.

Reports of coexistence of CD and morphea are scarce. One study reported the association in an 11-year-old female with type 1 diabetes mellitus [11] and another in association with hearing loss in a 13-year-old girl [12].

Both CD and LSc involve upregulation of inflammatory pathways, while deregulating anti-inflammatory pathways, with disruption of the integrity of normal tissue, and can thus both be put under the very broad category of autoimmune diseases [13, 14]. The pathogenesis of LSc involves one or several triggers combined with genetic contributing factors that cause a local epidermal-dermal signaling, which triggers both innate and adaptive immune upregulation, while downregulating the anti-fibrotic mechanisms [14]. The pathogenesis of CD involves upregulation of the interferon- γ pathway, driving the CD4+ TH1 response while downregulating the regulatory T-cell response, calling for an increase in proinflammatory cytokines leading to increased antigen presentation and cellular damage [13]. The possible mechanisms involved in the association with other diseases and in particular with dermatological ones still remain unclear. Several hypotheses have been proposed depending on the type of the association, but the most probable may involve both a genetically conditioned lack of mechanisms for the maintenance of immunological tolerance that consequently predisposes to autoimmunity and an abnormal small intestinal permeability, which may allow the crossing of endogenous or exogenous antigens and may provoke the immunological response, vascular alterations, and, lastly, vitamin and amino acid deficiency secondary to malabsorption in patients with CD [10].

Of note, juvenile LSc is typically a difficult condition to treat, often requiring long courses of potent topical steroids with variable success. Our patient responded fairly rapidly to treatment with only medium-potency topical steroids and with adherence to a GFD. Other skin manifestations linked to CD have been shown to improve only after strict adherence to a GFD [3, 5, 15]. It could be interesting to contemplate the notion that the relative ease of treatment might have been facilitated by adherence to a GFD.

In patients with autoimmune disease, such as type I diabetes mellitus or thyroiditis, screening may lead to a diagnosis of latent CD in 5–10% of patients. Conversely, the prevalence of autoimmune diseases is increased in patients with CD when compared with a control population [16]. This case demonstrates a 10-year-old girl with CD who presented for follow-up with LSc. Both disorders are linked to autoimmunity but have scarcely been previously reported to coincide, thus we find the report interesting and it could possibly point to an association.

This is a unique condition wherein both CD and morphea demonstrated complete resolution with a GFD. Given the rarity of scleroderma in the pediatric population and the relatively high prevalence of CD, we might suggest it to be prudent to screen all new patients with LSc for CD.

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Statement of Ethics

Written informed consent was obtained from the patient's parents for publication of this case report and any accompanying images. The paper is exempt from ethical committee approval as it is of a purely descriptive nature.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

G.H.: writing – original draft, conceptualization, methodology; A.H.: investigation, conceptualization, writing – review and editing; B.S.: formal analysis-histology, review and editing; B.Y.: investigation, conceptualization, project administration. All authors read and approved the final manuscript.

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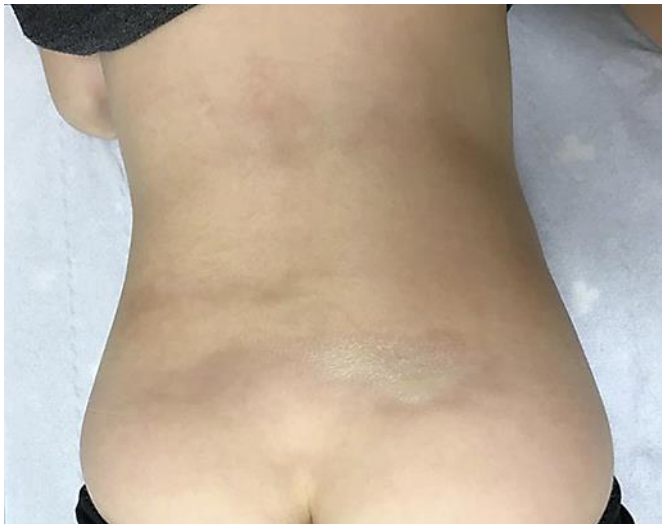


Fig. 1. Photograph of the patient’s lower back at presentation.

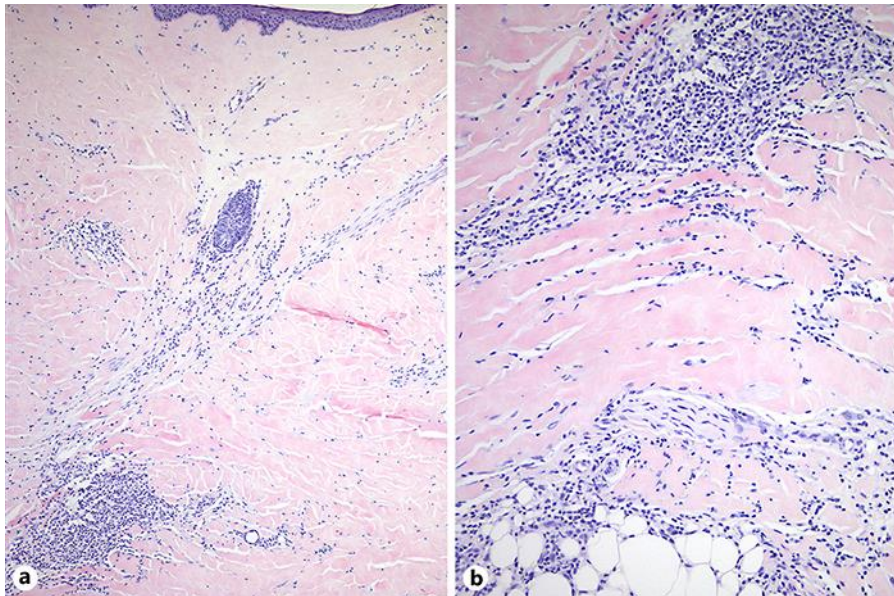


Fig. 2. Skin biopsy from the patient. **a** At medium-power magnification, focal loss of the rete ridges can be identified in the epidermis, but the most striking features are the intense, eosinophilic collagen and the perivascular inflammatory infiltrate that especially involves the deeper dermis (HE, $\times 10$). **b** At higher-power magnification, we can appreciate that the infiltrate is chronic in nature (primarily lymphocytes in this example) and that the collagen fibers are particularly swollen. Septal involvement of the subcutaneous fat is also seen in this section (HE, $\times 20$).