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ERYTHEMA NODOSUM REVEALING SILENT CELIAC DISEASE IN CHILDHOOD: A CASE REPORT

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ABSTRACT

Background*:** Erythema nodosum is the most frequent form of panniculitis, Its association with celiac disease remains uncommon, particularly in children. ***Case presentation*:** We report the case of a child presenting with recurrent erythema nodosum without gastrointestinal symptoms. Laboratory findings revealed severe iron deficiency despite prolonged oral supplementation. Serologic testing demonstrated elevated anti-transglutaminase IgA antibodies. Duodenal biopsy confirmed total villous atrophy with intraepithelial lymphocytosis confirming the diagnosis of coeiac disease. A gluten-free diet was introduced, leading to clinical and biological improvement. ***Conclusion: This case illustrates that celiac disease may present solely with extra-digestive manifestations such as erythema nodosum in children.

KEYWORDS: Celiac disease, Erythema nodosum, Extra-intestinal manifestations, Gluten-free diet, Iron deficiency, Malabsorption.

INTRODUCTION

Celiac disease is a chronic systemic autoimmune disorder triggered by gluten ingestion in genetically susceptible individuals. In the pediatric population, its prevalence is estimated at 3 to 13 per 1,000 children.[1] The disease most commonly presents in childhood and adolescence with gastrointestinal manifestations, often accompanied by extra-intestinal features. However, atypical forms characterized exclusively by extra-intestinal manifestations remain uncommon and may contribute to diagnostic delays.[1,2]

Here, we report the case of an 11-year-old girl presenting with erythema nodosum as the initial manifestation of celiac disease, highlighting the importance of considering atypical extra-intestinal presentations in pediatric patients.

CASE PRESENTATION

An 11-year-old girl was referred for painful erythematous–violaceous nodules on the anterior legs and dorsal feet, consistent with erythema nodosum. The lesions had appeared 4 weeks prior, each lesion resolved spontaneously within approximately 10 days without residual scarring, though new nodules continued to appear intermittently. No fever, digestive, respiratory, or systemic symptoms were present, and she was not taking any medication.

On examination, she was in good general condition with normal growth parameters (37 kg, 147 cm). Laboratory investigations showed a normal complete blood count (Hb 11.8 g/dL, MCV 85 fL, MCHC 33 g/dL, WBC 6400/µL, platelets 400,000/µL), normal renal function (urea 0.25 g/L, creatinine 7 mg/L), normal liver enzymes, and normal inflammatory markers (CRP 1.2 mg/L, ESR 17 mm/h). Ferritin was very low (5 ng/mL), vitamin D was decreased (10 ng/mL), and plasma renin activity was normal. Stool studies were negative, and fecal calprotectin was slightly elevated (534 mg/kg). Chest X-ray, thoracic CT, abdominal ultrasound, and ophthalmologic examination were unremarkable.

Given persistent iron deficiency despite supplementation, malabsorption was suspected. Serology revealed normal total IgA (2.83 g/L) but strongly positive anti-tissue transglutaminase and anti-endomysium antibodies (>300 U/mL each). Upper endoscopy showed mosaic-pattern gastritis and scalloped duodenal folds. Duodenal biopsy confirmed total villous atrophy with intraepithelial lymphocytosis (Marsh 3c), consistent with celiac disease. The patient was started on a strict gluten-free diet, resulting in complete resolution of cutaneous lesions

within 6 weeks, normalization of ferritin levels within 3 months, and significant weight gain (7 kg over 6 months).

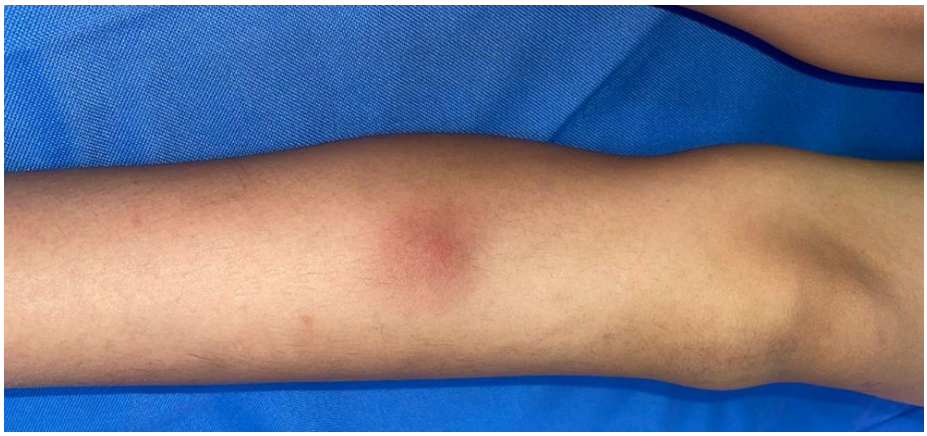

Figure 1: Subcutaneous nodule (erythema nodosum) on the extensor surface below the left knee.

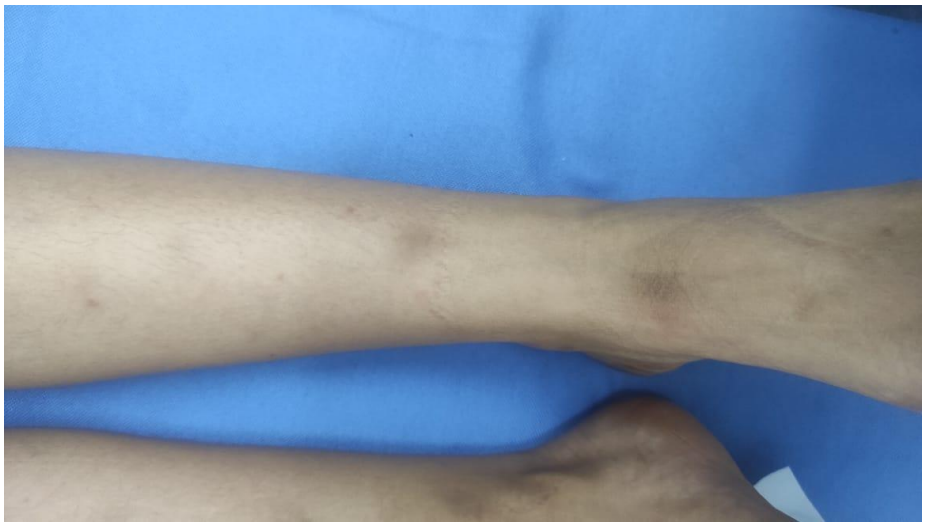

Figure 2: Healing erythema nodosum lesions located on the anterior aspect of the left leg and dorsum of the left foot.

DISCUSSION

Erythema nodosum is the most common clinical and histological form of panniculitis, characterized by inflammation of the fat septa. Its pathogenesis is thought to involve an immune complex–mediated reaction against a variety of antigens.[2] The most frequently encountered triggers include infections, sarcoidosis, chronic inflammatory bowel disease, rheumatologic disorders, drug reactions, and pregnancy; nevertheless, the etiology remains unknown in approximately 50% of cases.[1,2]

Celiac disease is a systemic autoimmune disorder caused by an abnormal mucosal immune response to the prolamins of wheat, barley, and rye in genetically predisposed individuals of any age. It leads to inflammation and destruction of the intestinal villi by the alcohol-soluble protein fraction of wheat gluten. Genetic factors play a crucial role in the pathogenesis of the disease, and it is estimated that all individuals with celiac disease carry either HLA class II DQ2 or DQ8 alleles.[2,7] In recent years, cutaneous manifestations have increasingly been recognized among the extra-intestinal features associated with celiac disease. These include dermatitis herpetiformis, pemphigus, chronic urticaria, psoriasis, lichen planus, atopic dermatitis, cutaneous vasculitis, and erythema nodosum, the latter remaining rare in the literature.[3,4]

The pathophysiology of erythema nodosum in celiac disease remains poorly understood. It is thought to result from increased intestinal permeability to various antigens, triggering a cutaneous hypersensitivity reaction to immune complexes.[4] Erythema nodosum typically presents acutely with painful, erythematous or violaceous nodules, predominantly on the anterior aspects of the legs. These lesions usually resolve within 4 to 7 weeks, following typical color changes, without scarring or ulceration, although persistent underlying causes may prolong their duration up to 18 weeks or more.[4] Several reports suggest that celiac disease can coexist with sarcoidosis, particularly pulmonary, which is a common cause of erythema nodosum. In these cases, the skin eruption was often attributed to sarcoidosis.[5,6] This

indicates that erythema nodosum may not be as rare in children with celiac disease as previously thought, and it could be overlooked in etiological work-ups, especially when gastrointestinal symptoms are absent. Our patient had no clinical or radiologic evidence of sarcoidosis and presented solely with cutaneous lesions, representing a latent form of the disease.

Malabsorption was suspected due to persistently low ferritin despite two years of oral iron supplementation. Notably, hemoglobin and mean corpuscular volume were within normal limits. This latent form likely affects primarily the proximal small intestine—the site of absorption for iron, calcium, and folate—while the rest of the intestine remains intact.[2] This explains the delayed presentation, low vitamin D level, absence of gastrointestinal symptoms, and preserved growth parameters.

It should be noted that, although the child's weight and height were within the normal range prior to initiating a gluten-free diet, his height percentile increased significantly after starting the diet. This indicates that his height at presentation was below his genetic potential. In general, erythema nodosum resolves within 5–8 weeks. Lesions associated with infection-induced erythema nodosum typically heal within approximately 7 weeks, although the condition may persist for up to 18 weeks if the antigenic stimulus continues.[8] In our patient, the rash duration was relatively short, likely because a gluten-free diet was promptly initiated following the diagnosis of celiac disease.

CONCLUSION

This case highlights the importance of recognizing erythema nodosum as a potential, albeit rare, extra-intestinal manifestation of celiac disease in children. Although celiac disease is primarily associated with gastrointestinal symptoms, a subset of patients may present with atypical or latent forms, characterized by normal growth parameters, minimal or absent digestive complaints, and subtle biochemical abnormalities such as isolated iron deficiency. In such cases, cutaneous manifestations like erythema nodosum may serve as the first clue to an underlying autoimmune disorder.

Our patient exemplifies the clinical relevance of early recognition and prompt management. The rapid resolution of erythema nodosum following the initiation of a gluten-free diet underscores the role of dietary intervention not only in restoring intestinal health but also in ameliorating systemic and extra-intestinal manifestations. Furthermore, this case emphasizes the need for a high index of suspicion for celiac disease in pediatric patients presenting with unexplained inflammatory skin lesions, especially when common triggers such as infection, sarcoidosis, or drug reactions have been excluded.

In addition, this report reinforces the importance of a multidisciplinary approach involving pediatricians, dermatologists, and gastroenterologists to ensure accurate diagnosis and optimal management. Early detection and treatment can prevent long-term complications, improve nutritional status, and promote normal growth and development. Clinicians should therefore consider including celiac disease in the differential diagnosis of erythema nodosum, particularly in the pediatric population, to facilitate timely intervention and improve patient outcomes.

CONSENT

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that no generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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