ACG CASE REPORTS JOURNAL

CASE REPORT | PEDIATRICS

Celiac Disease in a 16-Month-Old Child Presenting as Motor Regression

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ABSTRACT

Neurodevelopmental symptoms were previously believed to be a complication of celiac disease (CD) and rarely seen as presenting symptoms. One case has been reported so far where motor regression was the presenting symptom. We present a 16-month-old girl with postprandial vomiting and regression of motor skills. Examination revealed abdominal distension, hypotonia, and decreased motor movements in lower extremities. Celiac serology showed elevated tissue transglutaminase (tTG) immunoglobulin A (IgA) levels. Esophagogastroduodenoscopy with biopsies confirmed CD. Gluten-free diet led to the improvement of neurological and gastrointestinal complaints. We recommend keeping CD as one of the differentials in children with neurodevelopmental symptoms.

INTRODUCTION

Celiac disease (CD) is an immune-mediated disorder of the gastrointestinal tract due to consumption of the gluten in genetically susceptible individuals. It presents in various clinical ways ranging from gastrointestinal to extraintestinal manifestations. Neurological manifestations are rare as presenting signs and symptoms of CD in children.[1] Cerebellar ataxia, peripheral neuropathy, epilepsy, myoclonic ataxia, progressive leukoencephalopathy, cerebral vasculitis, dementia, headache, chorea, myelopathy, attention-deficit hyperactivity disorder, cognitive impairment, seizures, mononeuropathy multiplex, motor neuropathy, and Guillain-Barre–like syndrome have been described in children and adults with CD.[2,3] Earlier studies had described neurological symptoms as complications of CD. Conversely, recent studies have described neurological symptoms as presenting signs and symptoms of CD with or without gastrointestinal complaints.[4,5] To our knowledge, only 1 case has been reported so far, which describes motor regression as a presenting symptom of CD in children.[6]

CASE REPORT

A 16-month-old girl was admitted to our hospital for worsening nonbloody, nonbilious vomiting and regression of motor skills for more than 1 month. Her mother reported that she had a total of 10 episodes of vomiting in the past 1 month, which happened right after feeds. She would become fussy after feeds and then vomit 2-3 times in a row. She was taken to a primary care provider who started her on ranitidine with no improvement in symptoms. The patient was cruising earlier but had stopped doing so for the past 1 month. She was able to stand with support but unable to do so independently now. There was no history of loose stools, blood, or mucus with stools, fever, rashes, or constipation. She was taking about 15 oz of milk per day on average. There was a family history of hyperthyroidism in maternal grandmother and Crohn's disease in paternal grandfather. She was born full term with a birth weight of 2.92 kg (6 lb 7 oz).

Clinical examination showed an afebrile toddler, cachectic and irritable on appearance, a weight of 8.3 kg (1.91th percentile; Z-score −2.22), and 76 cm in length (18th percentile; Z-score −0.91). Abdominal examination revealed significant distension without

ACG Case Rep J 2019;6:e00192. doi:10.14309/crj.0000000000000192. Published online: August 27, 2019

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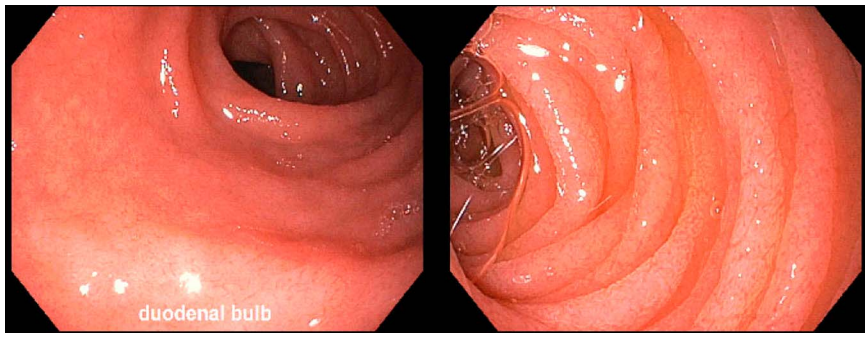

Figure 1. Endoscopy images were found to be grossly normal.

palpable organomegaly. Neurological examination revealed decreased muscle tone and movements in lower extremities compared with upper extremities. No cerebellar or meningeal signs were noted. An abdominal x-ray revealed significant stool burden. Bowel cleansing was performed with polyethylene glycol 3350. Laboratory examination revealed elevated tissue transglutaminase (tTG) immunoglobulin A (IgA) antibody levels (46.0 U/mL) and elevated tTG immunoglobulin G (IgG) antibody levels (29.0 U/mL). Magnetic resonance imaging of the lumbar and thoracic spine was normal. Extensive neurological and infectious workup including blood, urine, and cerebral spinal fluid cultures was negative. Endoscopic findings were normal (Figure 1).

Duodenal biopsies showed marked villous blunting and increased intraepithelial lymphocytes suggestive of CD (Figure 2). Gluten-free diet was recommended, and dietician was consulted for dietary recommendations. The patient was followed on an outpatient basis and antibodies normalized in 9 months after starting her on a gluten-free diet, after which she showed improvement in her motor skills. She is walking independently now and has been steadily gaining weight in her subsequent visits (Figure 3).

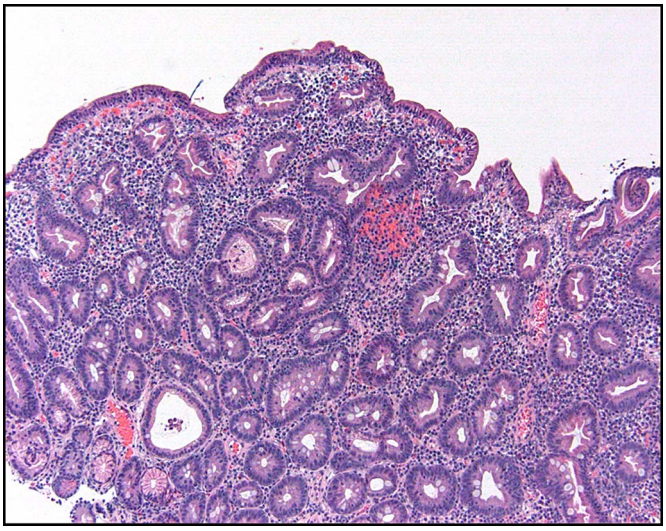

Figure 2. Histology showing villous blunting and increased intraepithelial cells.

DISCUSSION

The prevalence of CD in children has been estimated to be around 1%.[7] Typically failure to thrive, diarrhea, and abdominal distension have been described as common symptoms in the first 2 years of life.[8] In older children, the symptoms are more varied and can present with extraintestinal manifestations such as growth failure, isolated anemia, or behavioral disturbances apart from gastrointestinal complaints.[8] Multiple extraintestinal manifestations have been described in patients including dental hypoplasia, dermatitis herpetiformis, iron deficiency anemia, elevated liver enzymes, osteopenia, short stature, arthralgias, and behavioral changes.

Various neurological manifestations have been described in children. Diaconu et al found that 16 of 48 children diagnosed with CD had neurological symptoms as a presenting manifestation. The 3 most common symptoms were headache/migraine, attention-deficit hyperactivity disorder, and seizures. Other symptoms included cerebellar ataxia, mental retardation, and behavioral disorders.[9] A similar study to describe neurological symptoms associated with CD found that 13.5% patients had neurological symptoms including the ones described by Sedat et al and additionally included breath-holding spells and cerebral palsy.[10] Motor tics has also been reported as a manifestation.[11]

The underlying mechanism of neurological manifestations, though, is still not well understood.[12] Hadjivassiliou et al reported antigliadin antibodies cross-reacting against epitopes on Purkinje cells in those with gluten ataxia.[13] Alaedini et al found antiganglioside antibodies in patients with CD with peripheral neuropathy; 6 patients were positive for IgG antibody to GM1, GMD, GD1a, and GD1b gangliosides.[14] Hadjivassiliou et al reported 10 patients with positive antigliadin antibodies and HLA DQ2 who had white matter lesions on magnetic resonance imaging; 9 of 10 patients had a resolution of headaches on a gluten-free diet.[15] Deficiencies in nutrients such as pyridoxine have been described as a causative factor in depression in patients with CD.[16] Ciacci et al found a higher prevalence of panic disorder and major depressive disorder in patients with CD who had positive antithyroperoxidase antibodies.[17] Nutritional deficiencies have long been contemplated as the causative factor of neurological manifestations secondary

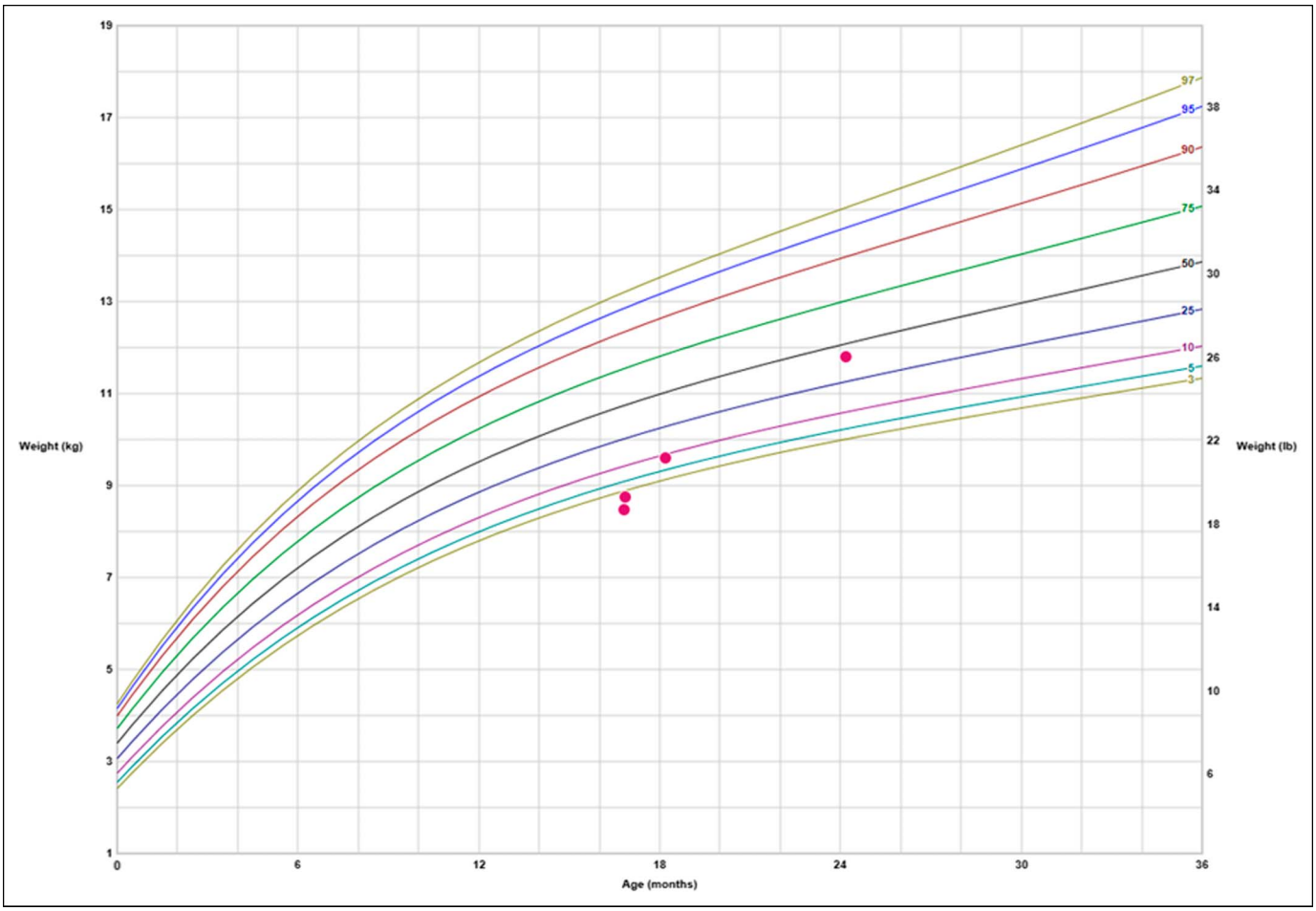

Figure 3. Patient's growth chart after starting on a gluten-free diet.

to malabsorption. However, vitamin replacement has rarely been found helpful. Also, vitamin deficiency is not always detectable.[4,5,18]

Our patient presented with a history of motor regression associated along with vomiting and constipation. Gluten-free diet improved not only the gastrointestinal symptoms but also the neurodevelopmental symptoms. We recommend keeping CD as one of the differentials in children with neurodevelopmental symptoms with or without gastrointestinal symptoms as early diagnosis and treatment change the outcome dramatically.

DISCLOSURES

Author contributions: A. Bashir wrote the manuscript and performed the literature review. Y. Mousattat provided initial clinical presentation and examination data. A. Lawson provided follow-up growth charts and clinical progression details. P. Patel edited the manuscript and is the article guarantor.

Financial disclosure: None to report.

Informed consent was obtained for this case report.

Received March 19, 2019; Accepted June 26, 2019

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