Failure to Thrive: Crohn's Disease Presenting as Avoidant/Restrictive Food Intake Disorder (ARFID) in a Young Child

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Abstract: Failure to thrive (FTT) is a state of insufficient nutritional intake that limits growth and development in children. FTT can be a diagnostic challenge for pediatricians. In the United States, FTT is prevalent in 5 to 10 percent of children in primary care settings.[1] With a broad differential diagnosis causing FTT, including both organic and inorganic causes,[2] pediatricians can have difficulty diagnosing and treating children with mixed etiologies. This report highlights how delays in obtaining the correct diagnoses and performing appropriate interventions can have significant consequences, including malnutrition, developmental delay, and psychosocial sequelae in a child. In this case, a child with FTT was initially diagnosed and treated for an inorganic cause, anorexia nervosa (AN), with an additional etiology of Crohn's disease not recognized until several years of unsuccessful treatment for the AN. This report highlights the fact that behavioral and psychological components, including a fear of eating and refusal to try a variety of foods, may be consistent with a presentation of Crohn's disease. It also emphasizes the need to continually re-evaluate diagnoses in young children, particularly when they are not responding to prescribed interventions.

Failure to thrive (FTT) can be a diagnostic challenge for pediatricians, who are typically the first clinicians to detect children suffering with this condition. FTT is a state of insufficient nutritional intake, which can be caused by inadequate caloric intake, inadequate caloric absorption, or excessive caloric expenditure.[1] In the United States, FTT occurs in 5 to 10 percent of children in primary care settings.[1] The differential diagnosis causing FTT can be very broad, including both organic and inorganic causes.[2] However, this distinction can be insufficient, because many children have mixed etiologies.[2] Delays in obtaining the correct diagnosis and performing appropriate interventions can have significant consequences, including malnutrition, developmental delay, and psychosocial sequelae.[2] This report emphasizes the need to continually re-evaluate diagnosis in patients who are not responding to prescribed interventions. In the case below, a child with FTT was initially diagnosed with food phobia and anxiety by a primary care physician at the age of 6. Subsequent evaluations by different specialists led to the diagnosis of an inorganic FTT, which was labeled as an eating disorder at age 8. Despite follow-up with psychiatrists, nutritionists, and other specialists, the patient maintained treatment-resistant iron-deficiency anemia, short stature, and pubertal delay. After an acceleration of weight loss at age 11 led to multiple medical hospitalizations, subsequent medical work-ups resulted in a diagnosis of Crohn's disease complicated by food-aversion secondary to anxiety.

Case

"Emma" is an 11-year-old female with history of microcytic anemia, short stature, weight loss, FTT, and a diagnosis of AN made at 6 years old by her primary care physician (PCP). Her mother had a normal pregnancy without any complications. She was a full-term baby with a birth weight of 3.63 kgs (8 lbs). Up to 5 years of age, Emma's developmental history was normal, and she met all her developmental milestones appropriately.

Emma's issues with food started very suddenly. She developed an aversion to solid food textures around 6 years of age. This was acute in onset and quickly grew into a fear of swallowing. Emma's peers teased her about the possibility that her teeth would fall out, which exacerbated her symptoms. She became extremely selective in her diet, to the point of only consuming chocolate milk, approxi-

mately half a gallon daily. Emma's skin tone also became very pale. These physical and behavioral changes became evident to her teachers, and her school suspected medical neglect, reporting to child protective services.

Emma's family initially attributed these sudden changes to a possible eating disorder in their daughter. They took Emma to her pediatrician for a medical evaluation, who found that her height and weight had fallen below the third percentile (Figure 1). These measures in height and weight met criteria for FTT. Emma's diagnosis was unusual in that most children with FTT typically present at much younger ages.[1] Subsequently, her pediatrician started a medical work-up for FTT, including an upper gastrointestinal endoscopic exam and basic blood work to evaluate her electrolytes and blood cells. The upper endoscopy revealed that Emma had a diverticulum in her distal esophagus. However, this finding was considered insufficient to explain Emma's FTT diagnosis. She was further referred to hematology/oncology for evaluation of anemia. The hematology-oncologists diagnosed iron-deficiency anemia and started Emma on ferrous sulfate supplements. A dietitian was consulted to assist with Emma's eating phobia.

Despite these interventions, Emma did not improve. Her weight and height remained below the 3rd percentile. When she was nearly 8 years old, bone x-rays indicated her bone age was 2 years below her chronological age. Her developmental pediatrician classified her issues with food as a feeding disorder of infancy/early childhood of nonorganic origin by age 8. At this time, Emma also started seeing a psychiatrist who diagnosed an avoidant/restrictive food intake disorder (ARFID). The psychiatrist suggested Emma try an inpatient eating disorders facility, but the family declined. She continued to prefer soft and liquid foods, and her anemia worsened, despite oral iron supplementation (Figure 2), leading to hospital visits for blood transfusions. Despite these active medical issues, Emma continued to excel academically in school.

At the time of presentation to our facility, Emma was 11 years and 3 months old chronologically, but her bone age was 6 years and 10 months. Shortly before admission, Emma lost 6.8 kgs (15 lbs) in 3 days following an episode of unremitting diarrhea. Emma was admitted to the hospital, tested positive for parvovirus, and received two blood transfusions. Emma had often noted pain after she ate, but denied any emesis, diarrhea, or greasy stools. After discharge, she continued to see her primary care physician on a weekly basis for weight checks, but failed to recover the lost weight, and began losing weight again, with a loss of 0.68 kgs (1.5 lbs) in a week and a half following discharge. At this time, the primary care physician recommended admission to an eating disorders unit. Her family agreed, and brought her to the ER to obtain medical clearance prior to admission to a psychiatric eating disorders program.

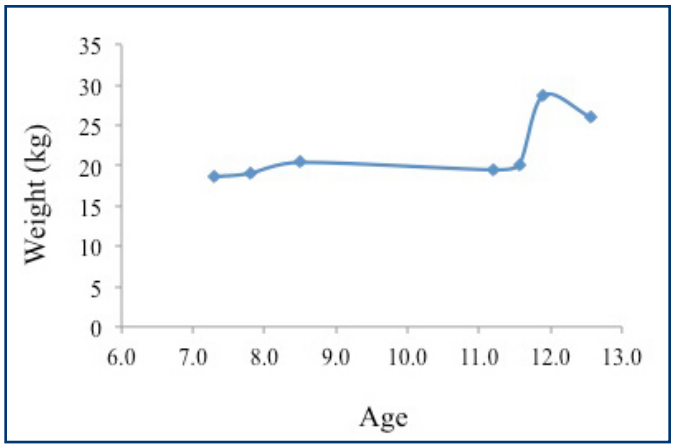

Figure 1

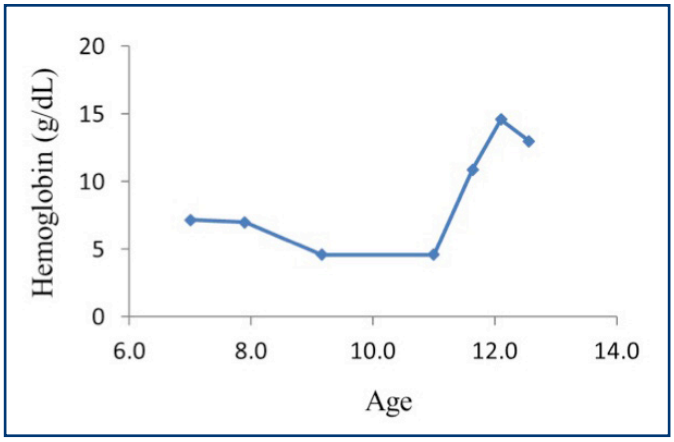

Figure 2

Given Emma's second presentation to our hospital without significant improvement in her weight within a

month, physicians began to consider the possibility that Emma had an underlying undiagnosed medical condition. Detailed physical exam revealed clubbing of the nails and trouble breathing. Placing these findings in the context of her poor growth and weight gain, the physicians began a full workup for cystic fibrosis (CF). CF testing was conducted, including cystic fibrosis transmembrane conductance regulator (CFTR) mutation testing, sweat chloride test, pulmonary function testing, chest CT, and colonoscopy. The pulmonary function tests were normal, and the sweat test was negative. However, the colonoscopy revealed intestinal abnormalities, including aphthous ulcers, cobblestoning, and discontinuous lesions in the large intestine. These findings were consistent with inflammatory bowel disease, and the specific diagnosis of Crohn's disease was established.

The diagnosis of Crohn's enabled Emma to begin treatment for the underlying medical cause of FTT. Emma was started on nasogastric tube feeds, with labs conducted and followed throughout admission to ensure that refeeding syndrome did not develop. Refeeding syndrome is a disorder that consists of metabolic abnormalities when a severely malnourished person begins to eat again.[3] Refeeding increases the basal metabolic rate, leading to decreases in serum electrolytes such as phosphate, potassium, and magnesium.[3] Glucose and thiamine may also decrease. Cardiac arrhythmias can result from this illness, with other significant risks including confusion, coma, convulsions, and cardiac failure.[3] Emma's hospital course was further complicated by pneumoperitoneum and peritonitis. After perforation was found in her sigmoid colon, a resection and colostomy were done. At this point, Emma was placed on infliximab, continued with nasogastric tube feeds of a nutritional shake and total parenteral nutrition, and began trying to consume regular meals.

Throughout the hospital course, Emma continued to show considerable anxiety towards food. She feared choking on large pieces of food. She reported abdominal pain intermittently, particularly following meals and relieved with bowel movements. Psychiatric consultation was obtained due to the patient's anxiety related to meals. However, the patient's family felt that psychiatric treatment had contributed to Emma's anxiety, and wanted to focus on resolving the now-identified medical issues resulting from Crohn's disease.

Emma had several hurdles to overcome prior to discharge. Psychiatry services recommended a trial of lorazepam to help with anxiety, but Emma did not tolerate the medication, reporting flushing and increased anxiety. Hydroxyzine was offered on as-needed basis, but the patient did not try the medication during her hospitalization. Psychology and psychiatry services continued to follow Emma, and recommended discharge into an intensive outpatient eating disorders program. However, the eating disorders program was located far from the family's hometown and they considered attending the program to be a hardship, and unnecessary given the medical diagnosis and treatment for Crohn's disease. Emma began eating a larger portion of her meals. When Emma could consume 50% of her meals in addition to nasogastric tube feeds, discharge was permitted. Psychiatry services recommended that if at subsequent visits to the gastroenterology clinic Emma was unable to maintain and gain weight, eating disorders treatment would facilitate normalization of the avoidance and restrictive pattern she had developed.

The patient is currently 12 years and 9 months old. Since her presentation to the hospital, her colostomy has been re-anastomosed, allowing restoration of bowel function. The patient continues to be on a medication regimen to treat her Crohn's disease, notably infliximab infusions every 8 weeks, cyproheptadine, esomeprazoe, and dietary supplementation. The patient's overall health is improving, as evidenced by an X-ray bone age of 10 at 12 years of age. Although Emma's bone age is delayed, it has advanced significantly in a year's time. Her predicted height is 4'9, assuming that she continues to grow well and her bone age does not continue to advance rapidly. At 12 years and 6 months of age, her weight was 26 kgs (57 lbs), which puts her at the 5th percentile for weight.

Discussion

This case report highlights a complex presentation of symptoms in a young child, including gastrointestinal discomfort, food aversion, anxiety, and excessive weight loss. In children, gastrointestinal symptoms can have a variety of medical and psychiatric etiologies. Child and adolescent psychiatrists are well-versed in recognizing these symptoms in young children suffering from neurodevelopmental, somatoform, anxiety, and eating disorders. Both AN and Crohn's disease can result in growth retardation, weight loss, and gastrointestinal symptoms that include abdominal pain, diarrhea, constipation, and vomiting (Table 1). Avoidant/restrictive food intake disorder (ARFID) is a recently defined condition, which consists of a prolonged disturbance in eating that leads to symptoms such as weight loss or inadequate growth and/or impaired psychosocial issues, such as an inability to eat with others.[4] ARFID and AN both present with similar general medical symptoms: anemia, fatigue, and bradycardia. Gastrointestinal symptoms in AN and ARFID are somewhat similar and include abdominal pain. However, they differ in that children with ARFID often develop a reluctance to eat food following an eating-related adverse event, and avoid foods based on sensory qualities, such as texture, color, taste, or temperature.[4] For example, children may develop a fear of swallowing following a frightening episode of gagging; choking or vomiting may be diagnosed with ARFID. These factors were consistent with Emma. In contrast, children with AN often initially choose to limit food intake because of concerns about weight, calories, health, or body appearance.[4] Emma did not show these concerns, and as such, a diagnosis of ARFID is a better fit for her symptoms.

Crohn's disease is an inflammatory disease of the intestine that also includes gastrointestinal and weight loss symptoms and can mimic an eating disorder.[5] Given that psychiatric disorders associated with gastrointestinal symptoms are more common in this age group than is Crohn's disease, the diagnostic difficulty in our case was very high. While the lifetime prevalence of anorexia nervosa is 0.9% in women,[6] the incidence of inflammatory bowel disease is only 7 per 10,000 children.[5] In addition, FTT is typically diagnosed in children before 3 years of age, with multiple causes stemming from aberrances related to the development of the gastrointestinal tract.[1] These causes vary extensively, and include problems of chronic diarrhea to genetic malabsorption syndromes.[1] Organic work-up for FTT often includes initial lab testing to evaluate for electrolyte, hematologic, and thyroid abnormalities.[1] Importantly, our patient showed normal development until 5 years of age, which is unusual for patients with FTT. This aspect of the presentation may have puzzled clinicians and supported a theory related to a psychiatric or acquired behavioral problem surrounding food consumption. Similarly, the report to the PCP that siblings teased her about her food behavior might also reinforce an idea of an inorganic etiology.

In retrospective review of Emma's case, there are several items that suggested an inflammatory bowel disease such as Crohn's disease. Patients with Crohn's disease can present with a variety of symptoms, including aphthous mouth ulcers, anemia, iron deficiency, and folate and vitamin B12 deficiencies, as well as elevated lab tests that include erythrocyte sedimentation rate (ESR), white blood cell and platelet cell counts, and C reactive protein (Table 1). Emma had a microcytic anemia resistant to iron treatment, suggesting an organic cause related to absorption. It takes the body about 120 days to generate healthy red blood cells,[1] but our patient did not respond within this period despite reporting medication compliance, and instead required multiple transfusions. This finding is suggestive of an organic factor interfering with iron absorption. In contrast, patients with AN often show excessive concern about weight, self-induced vomiting and other purging behaviors, bradycardia, lanugo hair, and amenorrhea (Table 1). Emma lacked overt concerns related to her weight and shape, instead reporting difficulty and pain related to eating.

The differential diagnosis of FTT can be very broad, is often categorized into organic and inorganic causes, but many children can have mixed etiologies. This was the case with Emma for over half of her life.[2] Interestingly, psychological factors have also been associated with Crohn's disease, including depression and low

Table 1. Symptoms Observed in Failure to Thrive, Anorexia Nervosa (AN)/Avoidant Restrictive Food Intake Disorder (ARFID), and Crohn's Disease

	FAILURE TO THRIVE	SYMPTOMS OF AN, RESTRICTING TYPE AND ARFID	CROHN'S DISEASE
General Medical Symptoms	Growth retardation	**Both AN and ARFID** Anemia Bradycardia Pancytopenia Fever Amenorrhea Growth retardation Fatigue Hypothermia	Mouth ulcers, anemia, iron deficiency, B12 and folate deficiency, elevated ESR, elevated WBC, elevated platelets, raised C reactive protein
Specific GI Symptoms	Difficulty feeding	**BOTH** Inadequate intake Avoidance of specific foods Abdominal pain **AN** Diarrhea Constipation Vomiting **ARFID** Loss of appetite Dyspepsia	Diarrhea, constipation, abdominal pain, vomiting
Common Psychiatric Symptoms	Fatigue	**AN** Anxiety Depression Fears of eating related to calories Weight concerns[a] Body shape preoccupations[a] Low self-esteem **ARFID** Irritability Sleepiness Distress Fears about eating related to texture Low mood Generalized anxiety	Depression Fatigue Anxiety

Note: ESR = erythrocyte sedimentation rate; GI = gastro-intestinal; WBC = white blood cells.
[a]Characteristics of AN inconsistent with ARFID.

self-esteem in children suffering from the disorder.[7-9] Studies suggest that patients with Crohn's disease have increased rates of depressive and anxiety symptoms compared with healthy controls of the same age.[9-10] When patients with undiagnosed Crohn's disease present with prominent mood and anxiety symptoms, abdominal symptoms are often more likely to be attributed to psychiatric rather than organic causes, including somatization.[11] This report, along with these studies, highlights the importance of frequent reappraisal of the working diagnosis when treating children with FTT, with consideration for both organic and inorganic causes.

Conclusion

The above case can serve to remind clinicians to closely consider organic etiologies of unexplained abdominal symptoms in school-age children in concert with the inorganic considerations. A disease process such as Crohn's, which is more common in teens and adults, should not completely be excluded from the differential, simply because it is statistically and demographically less likely in children. In addition, psychological symptoms should not point clinicians completely away from organic differentials, and should instead become a focus of additional clinical attention. A team approach

with both medical and psychiatric input in the treatment of young patients, and frequent reassessments when treatments are not effective, may improve care and accelerate the determination of the correct diagnosis and provisioning of optimal care. Finally, while Crohn's disease may have resulted in the disordered patterns of food consumption observed in Emma, throughout her hospital stay, she continued to show psychological and behavioral challenges related to eating. By providing her with the behavioral treatments developed for ARFID in concert with the management of her Crohn's disease, she is likely to have the best outcomes.

Take Home Summary

Missing the correct diagnoses and appropriate interventions can have significant consequences in a child's development. This case exemplifies how behavioral and psychological components of food consumption may also be consistent with a presentation of Crohn's disease. There is a need to continually re-evaluate diagnoses in young children, particularly when they are not responding to prescribed interventions.

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