

An unusual case of pediatric abdominal pain

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ABSTRACT

Chronic and recurrent abdominal pains are common complaints in children and adolescents, but the evaluation in the emergency department (ED) can be challenging. We present a rare yet serious case of a 17-year-old white female who presented to the ED with a 2-day history of diffuse abdominal pain, nausea, and intractable vomiting. Abdominal examination and imaging, including computed tomography (CT), were negative during an episode 6 weeks previously. This was her fifth similar episode in a 2-month period, and she had been seen at three different hospitals and admitted on each occasion. Three days prior to presentation to our ED, she was seen at a gastroenterology clinic and diagnosed with irritable bowel syndrome and an ovarian cyst. Symptomatic therapy during the current presentation, with intravenous fluids, antiemetics, and parenteral narcotics, failed to alleviate her abdominal pain and vomiting. Emergent CT evaluation revealed a high-grade colonic obstruction with focal circumferential narrowing in the transverse colon and a lower gastrointestinal follow-through radiograph with Gastrografin enema showed a classic "apple-core" lesion. Colonic adenocarcinoma with positive regional lymph nodes was found during emergent exploratory laparotomy. Pediatric patients with recurrent, episodic abdominal pain should undergo systematic evaluation and symptomatic treatment. A previous negative workup should not dissuade emergency physicians from proceeding with a systematic and thorough evaluation of the pediatric patient presenting with abdominal pain and vomiting.

RÉSUMÉ

Les douleurs abdominales chroniques et récurrentes sont des symptômes courants chez les enfants et les adolescents, mais leur évaluation à l'urgence peut être difficile. Nous présentons le cas rare mais grave d'une jeune femme d'origine caucasienne de 17 ans s'étant présentée à l'urgence après deux jours de douleurs abdominales diffuses, de nausées et de vomissements incoercibles. Un examen abdominal et une imagerie de l'abdomen, dont une

tomodensitométrie (TDM), s'étaient révélés négatifs lors d'un épisode six semaines plus tôt. Il s'agissait du cinquième épisode similaire dans un délai de deux mois. La patiente avait été vue dans trois hôpitaux différents et hospitalisée chaque fois. Trois jours avant sa visite à notre urgence, elle s'était rendue à une clinique de gastro-entérologie et avait reçu un diagnostic de syndrome du côlon irritable et de kyste de l'ovaire. Un traitement symptomatique au cours de cette visite comprenant l'administration intraveineuse de fluides, des antiémétiques ainsi que des stupéfiants par voie parentérale n'a pas réussi à soulager ses douleurs abdominales ou les vomissements. Une TDM en urgence a révélé une obstruction du côlon au stade avancé avec sténose circonferentielle localisée dans le côlon transverse. Une radiographie du tractus gastro-intestinal inférieur par lavement Gastrografin a révélé une lésion classique en « cœur de pomme ». Un adénocarcinome du côlon avec ganglions lymphatiques régionaux positifs a été observé lors d'une laparotomie exploratrice en urgence. Les patients pédiatriques présentant des douleurs abdominales récurrentes et épisodiques doivent faire l'objet d'une évaluation systématique ainsi que d'un traitement symptomatique. Des examens antérieurs négatifs ne devraient pas dissuader les médecins d'urgence de procéder à un examen systématique et approfondi de jeunes patients présentant des douleurs abdominales et des vomissements.

Keywords: abdominal pain, adenocarcinoma, adolescence, colorectal, diagnosis, pathology

Chronic and recurrent abdominal pains are common complaints in children and adolescents, and the evaluation in the emergency department (ED) can be challenging.¹ Distinguishing between serious conditions and mild, often self-limited illness causing abdominal pain can be difficult.² The challenge is to detect those patients with organic disease from the majority who have a functional pain disorder.³ Complaints of chronic and recurrent abdominal pain

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occur in 9 to 15% of children, and the prevalence increases with age.^{4,5} It has been shown that as many as 17% of adolescents reported weekly episodes of abdominal pain¹ and 13 to 17% have had chronic pain.³ An organic etiology was determined in 25% and a diagnosis of psychosomatic or possible psychosomatic pain was made in 62%.⁶

The two broad categories in the differential diagnosis for recurrent abdominal pain in children and adolescents are functional and organic disorders.⁷ Functional disorders are conditions in which the patient has a variable combination of symptoms without any readily identifiable structural or biochemical abnormality.⁸ Common organic causes of chronic or recurrent abdominal pain include constipation, carbohydrate malabsorption, musculoskeletal pain, parasitic infection, dysmenorrhea, and peptic disorders.⁹⁻¹² Tumour as a cause of abdominal pain is, on the other hand, very rare in adolescents.¹³ When evaluating a pediatric patient with abdominal pain, age must be a primary consideration because causes vary from infant to adolescents. One must consider the likelihood of a particular disease presenting in any age group.^{14,15} A detailed history and physical examination will often be sufficient to lead to the most common diagnoses.³ Onset and quality of pain, bowel habits, fever, anorexia, nausea, and emesis are other factors that need to be explored. Vomiting is a common symptom in patients with abdominal pain, and in a child in whom the abdominal pain is accompanied by vomiting, surgical intervention could be necessary.¹⁵

Here we present a case of an adolescent girl with recurrent abdominal pain with vomiting who was eventually diagnosed with a serious bowel issue.

CASE REPORT

A 17-year-old girl was brought to the emergency department (ED) with complaints of abdominal pain, nausea, and intractable vomiting. She reported symptom onset 2 days previously that was initially mild but steadily progressed. The pain was diffuse, intermittent, and crampy and came in waves. On arrival at the ED, she rated her pain as 10 on a scale of 0 to 10. Her symptoms were resistant to over-the-counter remedies and to promethazine, prescribed by another physician during a previous episode. The patient denied fever, chills, or diaphoresis. Her last bowel movement was 4 days previously. She was unsure if she was passing flatus.

She reported a 13.6 kg weight loss over the previous 5 months, associated with dieting. The remainder of the review of systems was negative. Past surgical history included herniorrhaphy. Her past medical history included four previous similar episodes of abdominal pain and vomiting, detailed below, as well as depression and treatment for alcohol, tobacco, and marijuana abuse. The patient was adopted and reported that her birth mother died of breast cancer. The patient was not sexually active. Medications used included citalopram (Celexa), oral contraceptives, promethazine (Phenergan), hyoscyamine (Levsin), and cetirizine (Zyrtec).

The patient had experienced four previous similar episodes, each culminating in ED evaluation and admission. Once the pain started, it would remain diffuse, crescendo over an hour, and become fairly constant, culminating in intractable vomiting. There were no bowel movements during the episodes, and between episodes, she had periods of constipation alternating with loose stools. She reported one bowel movement daily or every other day.

Her initial episode of pain was 2 months previously while traveling in the midwestern United States. She had no other significant travel history. She was evaluated, admitted overnight, diagnosed with constipation, treated with two enemas, and discharged. Three days later, her symptoms recurred, and she was admitted to a different hospital in her hometown. She was treated with GoLYTELY (polyethylene glycol and electrolytes) through a nasogastric tube with symptom resolution. Nine days later, again while out of town, she was seen in a third ED for recurrent symptoms. A computed tomographic (CT) scan of the abdomen and pelvis at that time revealed a 3.2 cm ovarian cyst with fluid in the cul-de-sac. No signs of obstruction or thickening of colon were seen. One month later, she was seen and again admitted to the hospital in her hometown. The patient and her father reported that during that hospitalization, pelvic examination and pelvic ultrasonography were normal, other than revealing fluid in the cul-de-sac. She was diagnosed with rupture of the previously seen ovarian cyst. Three days prior to presentation, the patient was seen at our university's gastroenterology clinic and diagnosed with probable irritable bowel syndrome (IBS). She was started on hyoscyamine.

Two days prior to presentation, she again developed mild diffuse abdominal pain, with nausea and anorexia. On the day of presentation, the pain crescendoed, and she developed intractable vomiting. The patient

presented to our university's ED for evaluation. Vital signs were blood pressure 123/80 mm Hg, heart rate 96 beats/min, respiratory rate 18 breaths/min, and temperature 36.7°C. Owing to severe pain with active emesis, the initial examination was deferred until the patient was given an initial fluid bolus and parenteral doses of dolasetron and morphine. Examination at that time showed mild abdominal distention with hypoactive bowel sounds and diffuse tenderness centred on the epigastrium without true localization. There were no peritoneal signs. There was no mass, organomegaly, or costovertebral angle tenderness. Pelvic examination was not performed; however, she was not sexually active and a previous CT abdomen/pelvis and pelvis US were normal except for an ovarian cyst. She reported no vaginal bleeding or discharge, dysuria, hematuria or melena/gross blood per rectum. A rectal exam was considered; however, due to the intensity of her symptoms during the ED visit, the rectal exam was not performed. Otherwise the physical examination was normal.

The patient was hydrated and treated with additional antiemetics and pain medications over a period of several hours. Laboratory evaluations, including complete blood count with differential, electrolytes, blood urea nitrogen, creatinine, lipase, and urinalysis, were normal; a urine pregnancy test was negative. Her symptoms decreased but did not resolve. A supine abdominal radiograph was obtained, which was remarkable for scant stool and a paucity of bowel gas (Figure 1). These findings, in conjunction with her continued symptoms, prompted further evaluation with a contrast-enhanced abdominal and pelvic CT scan. This study revealed a high-grade obstruction owing to focal circumferential narrowing in the transverse colon (Figure 2). The cecum, ascending colon, proximal colon, and midtransverse colon were dilated and fluid filled. Gastrografin enema confirmed the CT finding and demonstrated an "apple-core" lesion in the midtransverse colon that was fixed throughout the procedure (Figure 3).

Surgery was consulted, and an exploratory laparotomy was performed. A 5 cm mass was felt in the transverse colon consistent with a circumferential obstructive adenocarcinoma. No other abnormalities were seen. The patient underwent an exploratory laparotomy with transverse colectomy. Pathology subsequently showed a poorly differentiated colorectal T3N1 mucinous adenocarcinoma with full-thickness invasion into pericolonic adipose tissue.



Figure 1. Supine abdominal radiograph shows a small amount of gas projected over the descending colon and the rectosigmoid, with some formed stool material in the rectosigmoid. There is a relative paucity of small and large bowel gas in the abdomen. There is no abnormal intra-abdominal calcification as well as no obvious mass effect.

DISCUSSION

Primary tumours of the gastrointestinal tract among children and adolescents are rare, representing less than 5% of all pediatric neoplasms.¹⁶⁻¹⁹ Colorectal carcinoma is second only to primary liver malignancy as the most common solid malignancy of the gastrointestinal



Figure 2. Computed tomographic scan of the abdomen and pelvis with oral contrast showing a high-grade colonic obstruction with the focal circumferential narrowing with thickening seen in the distal transverse colon (arrowheads). The transverse colon just proximal to this narrowing measures 4.8 cm in width. The colon distal to this transition point is decompressed.

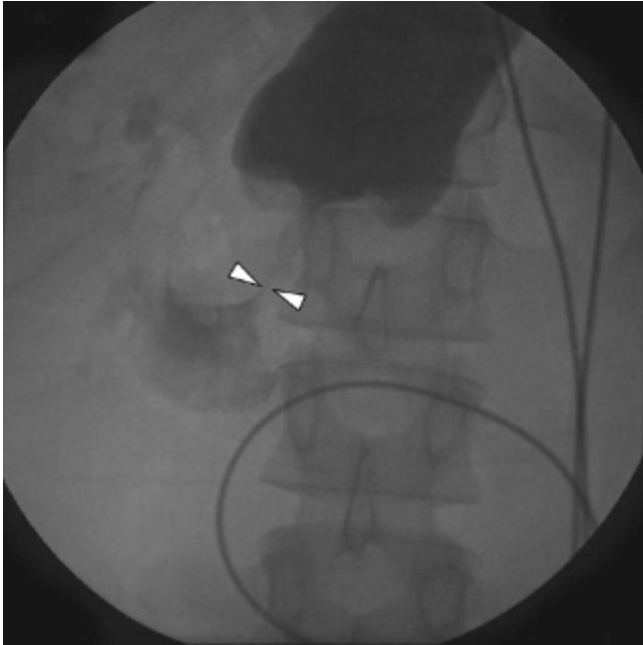


Figure 3. Gastrografen enema of colon illustrates the classic "apple-core" lesion at the site of the focal high-grade stenoses approximately 3 cm in length seen in the distal one-third of the transverse colon. Some Gastrografen can be seen creeping through the narrow portion into the proximal transverse colon (*arrowheads*).

tract.¹⁸⁻²¹ Mucin-secreting adenocarcinoma is more common in children, and this type of carcinoma is associated with rapidly advancing disease and a poor prognosis in children.¹⁶ There is a progressive increase in the incidence of the disease in patients older than 10 years, with a mean of 16 years.²² Very few cases have been reported in children less than 10 years of age.²³ The current literature on colorectal cancer in children and adolescents has mostly consisted of case reports; however, a population-based study providing descriptors of prognostic factors was recently published.²² Earlier studies have indicated a heavy predilection of colorectal carcinomas among males in the pediatric population, but this study showed only a slightly higher incidence among males.^{22,24,25}

In this article, we describe a 17-year-old female who presented to the ED with recurrent symptoms of abdominal pain, nausea, emesis, and intermittent constipation. After evaluation in the ED and subsequent laparotomy, she was diagnosed with poorly differentiated mucinous colonic adenocarcinoma with metastasis. The signs and symptoms of colonic carcinoma in childhood are no different from those in adults, but the infrequency of this condition leads clinicians away from a workup for malignancy.²⁶ After

abdominal pain, the most common presenting symptoms are, as seen in this case, nausea, vomiting, weight loss, and change in bowel movement. Thirty-five percent of the pediatric population with colorectal cancer present with nausea and vomiting.²⁷

On the other hand, constipation, dysmenorrhea, functional pain, mittelschmerz, ovarian cyst or torsion, urinary tract infection, pelvic inflammatory disease, and viral illness are more common causes of abdominal pain in a teenage female.¹⁵ Neoplasm is rare in this age group. Our patient suffered from intermittent intractable vomiting, which is concerning for a more serious abdominal disease process. Associated symptoms such as nausea and vomiting are more frequently reported in appendicitis,² the most common pediatric surgical emergency,^{14,28} but this did not fit the clinical picture in this case. Our patient presented with periodic intractable emesis over a 2-month period, which made appendicitis unlikely. A history of recurrent episodes of the same symptoms with previous negative evaluations may have falsely reassured and misled clinicians in this case. Our patient had a recent negative workup and was presumptively diagnosed with IBS by a gastroenterologist only 3 days previously. The abdominal and pelvic CT performed around 1 month earlier showed an ovarian cyst, but the scan was read as negative for obstruction or colon wall thickening by an attending radiologist. This study was not reread at our institution. The patient was thus diagnosed with IBS and an ovarian cyst. There is a positive correlation between psychological distress and abdominal pain,^{3,29} but in our patient, no such triggering factor was found.

Because of a previous CT scan of the abdomen and pelvis that was read as negative for obstruction or colon wall thickening, the presentation might have misled the emergency physician into believing that the cause of the pain was a functional gastrointestinal disorder. These disorders include a variable combination of chronic or recurrent symptoms not explained by structural or biochemical abnormalities.²⁹ The pain was diffuse, not localized and intermittent. This, in association with intermittent diarrhea, could be IBS but should raise concern for rectosigmoid processes such as ulcerative colitis, Crohn disease, or malignancy.³

Pain, anemia, and abdominal distention are observed in 63% of cases of colorectal cancer and about 75% of colorectal patients under age 20 have

associated rectal bleeding.³⁰ Acute intestinal obstruction, as seen in our case, is not a common presentation.³¹ With regard to the recognition based on clinical examination, a delay in diagnosis of as long as 2 years has been noted, but the average duration from onset of symptoms to diagnosis is approximately 7.5 months.³⁰ As mentioned, prognosis in childhood colon cancer has been consistently poor, with reported 5-year survival ranging from 7 to 12%.^{16,18,32-34} Some reasons for the poor prognosis might be delayed recognition, a higher incidence of highly malignant mucin-secreting tumors, and the potential for more rapid tumour growth in a subject who is actively growing.^{16,35} Poorly differentiated lesions and lymph node involvement, as seen in this case, have a higher incidence in children than in older subjects.³⁶ The most common tumour histology is adenocarcinoma, as seen in this case, and the most common location of presentation is the right colon.²² Our patient was diagnosed with midtransverse colon obstruction secondary to adenocarcinoma. The mainstay of therapy for patients with colorectal carcinomas is surgical resection,²² and our patient underwent exploratory laparotomy with transverse colectomy.

CONCLUSION

Colorectal cancer occurring in adolescence is extremely rare and carries a poor prognosis owing to late diagnosis and aggressive tumour biology. Abdominal pain with nausea and vomiting is common in the pediatric population and usually represents a benign process; on the other hand, this combination can be consistent with a more serious abdominal disease process. Pediatric patients with recurrent, episodic abdominal pain should undergo systematic evaluation and treatment, especially if vomiting is associated with the pain. Should the patient fail to respond in the expected manner, additional evaluation and/or consultation should be pursued. This is true even when previous evaluations have been unrewarding. Progressive weight loss, a change in bowel habits, and intermittent bowel obstruction are the textbook presentation of colonic adenocarcinoma; however, both the age of the patient and a previous negative workup might have led the emergency physician to believe that the symptoms were related to a functional disorder.

Competing interests: None declared.

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