

## Colorectal cancer in pediatric with obstructive symptoms: a rare case report



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### ABSTRACT

**Introduction:** Colorectal cancer or known as CRC, is rare among adolescents younger than 20 years old. CRC diagnosis in children is commonly delayed until it reaches the advanced stage due to the nonspecific symptoms mimicking other gastrointestinal disorders. Most CRC in children is poorly differentiated mucinous adenocarcinoma, in contrast to CRC in adults, mostly moderately or well-differentiated adenocarcinoma. The delay in diagnosing CRC in children leads to an extremely poor prognosis rather than adults. Thus, this article aimed to report a rare case related to the CRC in pediatric.

**Case presentation:** A rare case of a 14-year-old male present with abdominal distention since a month before presented to the emergency department. He also complained of bilious vomiting and not passing stool for three days, there was decreased body mass of about 15 kilograms since a year ago, and a family history of malignancy was refused. There was a distended abdomen, arm contour and metallic sound. The full blood count showed no significant results. We found a dilated prominent bowel filled with air in the entire abdomen from plain abdominal radiography that led us to suspect total bowel obstruction. We decided to do an emergency exploratory laparotomy. Intraoperatively, we found multiple masses look like polyposis in the intraluminal of a descending colon ranging about 10 centimeters long. The histopathological finding showed adenocarcinoma well-differentiated colon T3N0. Postoperatively, there were no complications from the surgery until a month after surgery, and we suggested our patient continue his treatment with adjuvant chemotherapy.

**Conclusion:** The treatment of colorectal cancer in pediatric is complete surgical resection of the tumor and chemotherapy. Early detection of colorectal cancer is required to prevent further morbidity and mortality.

**Keywords:** adenocarcinoma, bowel obstruction, children, colon cancer, colorectal cancer.

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### INTRODUCTION

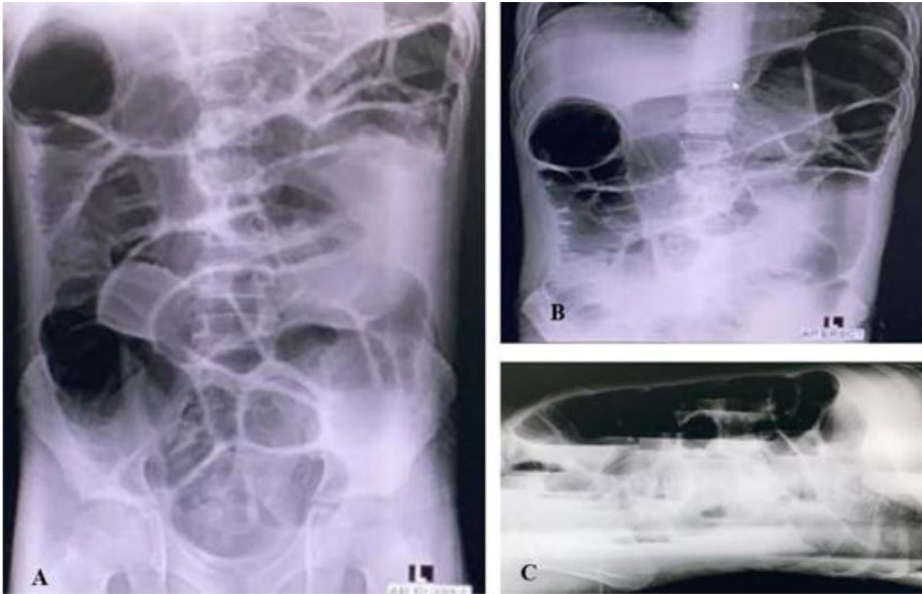
Colorectal cancer or known as CRC, is rare among adolescents younger than 20 years old.<sup>1-3</sup> Despite its rarity, CRC is the fourth leading cause of death among adolescents with cancer.<sup>4</sup> The annual incidence of CRC is around 1:10 million. The incidence of colorectal cancer in patients 15 to 29 years is about 2% of all malignancies.<sup>3</sup> Geographically, colorectal cancer is commonly found in developed countries<sup>5</sup>, and the incidence may differ in every country due to dietary habits and environmental exposure.<sup>6</sup> The diagnosis of CRC in children is commonly delayed until it reaches the advanced stage due to its nonspecific symptoms mimicking other gastrointestinal disorders.<sup>5</sup> The tumor can arise in any site throughout the large intestine.<sup>3</sup> The symptoms of CRC usually vary depending on the site of the tumor.<sup>6</sup>

However, the pediatric CRC symptoms most reported are abdominal pain and vomiting.<sup>1,3</sup> Children with acute bowel symptoms should be treated with prompt abdominal exploration.<sup>5</sup> The diagnosis of CRC involves clinical, laboratory, and radiographic studies.<sup>3</sup> Moreover, a biopsy is required for determining the stage of CRC.<sup>5,6</sup> Most CRC in children is poorly differentiated mucinous adenocarcinoma<sup>1-3,5,6</sup> in contrast to CRC in adults, which are mostly moderately or well-differentiated adenocarcinoma.<sup>5</sup> The delay in diagnosing CRC in children leads to an extremely poor prognosis compared to adults.<sup>2,3</sup> Thus, this article aimed to report a rare case related to the CRC in pediatric.

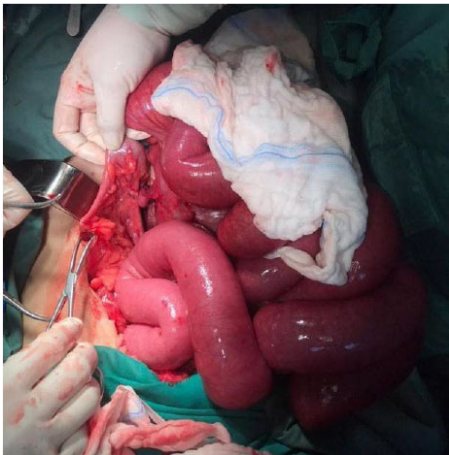
### CASE DESCRIPTION

A 14-year-old male present with abdominal distention since a month before presented

to the emergency department. He also complained of colic abdominal pain, bilious vomiting and not passing stool for three days. There was decreased body mass of about 15 kilograms since a year ago and no family history of malignancy. From the physical examination, we found a distended abdomen, arm contour and metallic sound. There were no significant findings from the full blood count besides thrombocytosis (platelet count of 758,000/ $\mu$ l). The plain abdominal radiography (*Figure 1*) showed dilated prominent bowels filled with air in the entire abdomen that led to our suspicion of total bowel obstruction. There was also a visualization of empty space at the left side between the dilated bowels, which raised our suspicion of total obstruction in the left part of the bowel. Therefore, we decided to do an emergency exploratory laparotomy. Intraoperatively, we found



**Figure 1.** Plain abdominal x-ray at initial presentation showed a dilated bowel with prominent air in the whole abdomen. (A) AP supine position identifies an empty space at the left region of the abdomen. (B) AP erect position. (C) Left lateral decubitus position showed stepladder feature.



**Figure 2.** Intraoperative findings of maximal dilatation of the jejunum-ileum-ascending colon-transverse colon-1/3 of descending colon.

maximal dilatation of the jejunum-ileum-ascending colon-transverse colon-1/3 of descending colon (Figure 2) and also multiple intraluminal masses looking like polyposis in the descending colon ranging about 10 centimeters long (Figure 3), the rectosigmoid colon was collapsed, the peritoneum and the liver was smooth with no palpated mass. We performed colon resection at part of the colon tumor and

followed by the anastomosis of colocolo. The histopathological finding showed well-differentiated colon adenocarcinoma pT3N0 (Figure 4). Postoperatively, there was no complication from the surgery; the patient started feeding on the 2<sup>nd</sup> day by drinking 50cc of milk every 3 hours on the 3<sup>rd</sup> day and began to eat porridge on the 4<sup>th</sup> day, then he was discharged from the hospital on the 5<sup>th</sup> day. The patient then visited the pediatric surgery polyclinic three additional times (a week, two weeks, and a month after discharge from the hospital) with no complaint or any complication, and the stitches healed greatly. We suggested our patient continue his treatment with adjuvant chemotherapy. However, the patient's parents refused the procedure.

## DISCUSSION

The cases of CRC involving children or adolescents were more common in males.<sup>2</sup> The incidence is consistent with our patient, who is a 14-year-old male. Most of the patients were diagnosed in stage III (50%) or stage IV (44%), followed by stage II (6%) and none in stage I.<sup>7</sup> These statistics are comparable with the fact that colorectal cancer is the fourth leading cause of cancer deaths among adolescents.

Thus, there are about 800 deaths each year.<sup>4</sup> Having a family history of cancer does not have a strong relationship with colorectal cancer in children.<sup>6</sup>

Pediatric CRC can arise in any site throughout the large intestine. Colon malignancy either in ascending or descending were observed in every case, about 30%, meanwhile rectal tumors are found in around 25% of the CRC cases.<sup>3</sup> The location of the tumor in our patient was in the descending colon, which is similar to the common location.

Colorectal carcinoma mostly related to its primary location in the large intestine.<sup>5</sup> Approximately 50% of children as well as adolescents who experience CRC often present with sign and symptoms as follows: acute abdominal obstruction, perforation, or severe pain resembling appendicitis in the abdominal area.<sup>5</sup> Theoretically, the most common symptom that appears in patients is abdominal pain, while other accompanying symptoms can include bleeding in the rectum area, changes in bowel habits, a race of nausea and vomiting, and decreased body weight. Our patient presented almost all signs and symptoms such as flatulence, abdominal pain, vomiting, changes in bowel habits, and decreased body weight. Colon cancer on the right side can lead to more threatening symptoms. However, it is commonly associated with mass in the mass, decreased bodyweight, melena, decreased appetite, diarrhea, and also anemia of iron deficiency.<sup>3,4,6</sup> The mean duration of symptoms before diagnosis was approximately three months.<sup>3</sup> Changes in bowel habits, such as constipation or diarrhea, and in the caliber of the stool usually occur before the onset of prolonged stools, rectal bleeding, or other changes.<sup>5</sup>

Histologically, most CRC in adults is moderately differentiated or well-differentiated adenocarcinomas.<sup>5</sup> On the other hand, a higher incidence of mucinous adenocarcinoma (more than 50%) was performed in pediatric patients. It also frequently with the signet ring cell type.<sup>1,3,5,6</sup> The percentage of histological signs such as poorly differentiated to undifferentiated, signet-ring-cell-containing carcinomas, and also mucinous type, is higher in younger patients than in adults.<sup>1,8</sup> However, our patient's histology

differs from the histological findings of most CRC in pediatric, showing well-differentiated colon adenocarcinoma, which is uncommon in a pediatric population.

There are limited studies on pediatric CRC due to the small number of patients with no large institutional cohort or prospective study to guide the management.<sup>2</sup> Therefore, treatment of colorectal cancer in pediatric patients is carried out according to adult protocols such as radiotherapy, surgery, chemotherapy, and targeted therapy.<sup>2,3,5</sup> However, the proposed therapy is complete surgical resection.<sup>5</sup> A lot of patients underwent emergency surgery because of an obstruction in the intestine.<sup>2</sup> This condition was similar to our patient, who sustained acute intestinal obstruction, hence the reason we performed complete resection of the tumor.



**Figure 3.** Intraluminal masses are looking like polyposis, with a diameter of each mass from 0.5cm to 1cm in the descending colon.

Patients with pediatric colorectal cancer usually present with advanced disease (III or IV), angio-lymphatics invasion, perineural invasion, and distal tumors.<sup>2</sup> Our patient presented with stage IIA, which was estimated from his clinical and histopathological findings of T3N0M0.

If diagnosed with a treatable CRC, then the recommended management is resection. Left-sided tumors require subtotal colectomy, while right-sided tumors require extended hemicolectomy. Other therapies such as chemotherapy and radiotherapy as adjuvant therapy are needed, but so far, they are controversial.<sup>6</sup> The widely used postoperative adjuvant chemotherapy combination is consisting of FOLFOX (oxaliplatin, 5-fluorouracil [5-FU] plus leucovorin), XELOX (oxaliplatin plus Xeloda) and irinotecan.<sup>2,3,5</sup>

The overall prognosis of CRC in children and adolescents typically performs a worse prognosis.<sup>2,3</sup> Recurrences were found at 3–17 months from the time of original diagnosis, while the 3- and 5-year survival rates were 34.9% and 23.2%, respectively, with a median survival time of 26 months from the initial diagnosis.<sup>2</sup> Metastasis of CRC is presented in about 37% of young adults. Most cancer will spread to the liver, lung, lymph nodes, and peritoneum as distant metastasis. Predictors of poor outcome besides the staging are incomplete resection, the proportion of signet-ring cells >10%, mucinous histology, and absence of an *in-situ* component.<sup>1</sup> We evaluated that there were no sign or symptom of metastasis

in our patient, no mucinous histological findings, and the postoperative results were favorable; hence the prediction of the prognosis is better than most of the pediatric CRC patients. However, there may be a higher risk of recurrence as the patient refused to undergo chemotherapy.

## CONCLUSION

The proposed treatment of CRC in pediatric patients is complete surgical resection of the tumor, with chemotherapy can be an adjunctive therapy. The disease stage is the most important predictor of prognosis; therefore, early detection of colorectal cancer could prevent further morbidity and mortality.

## DISCLOSURES

### Funding

The authors received no financial support for the authorship of this article.

### Conflict of Interest

The authors declare that there is no conflict of interest.

### Author Contribution

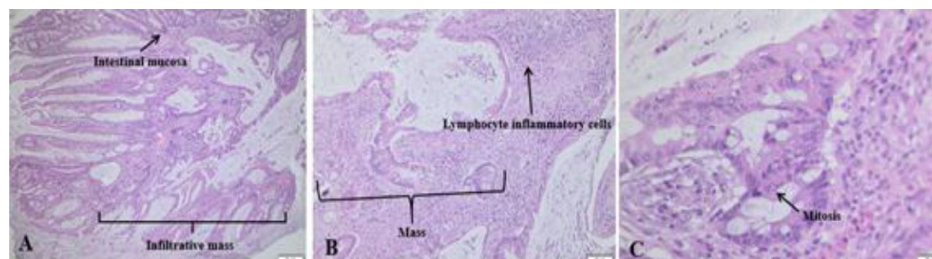
Conceptualization, patient's management, surgery, writing-review, Flora Agustina; conceptualization, writing-original draft preparation and editing, Felicia.

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**Figure 4.** Histopathologic features of the tumor (well-differentiated adenocarcinoma). (A) Hematoxylin and Eosin (HE) staining with magnification 4x; tumor cells infiltrating the stroma. (B) Hematoxylin and Eosin with magnification 10x; glandular mass structure, infiltrating the stroma. (C) Hematoxylin and Eosin with magnification 40x; tumor cell with pleomorphic core, prominent nucleoli, mitosis (+), bigger core-cytoplasm ratio, forming glandular structure.

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