

## Colorectal Cancer in a 17-Year-Old Boy: A Case Report

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### ABSTRACT

**Introduction:** Colorectal cancer is the fifth most common malignant neoplasm worldwide. Commonly found in adults, the adolescent population is scarce. Colorectal cancer diagnosed and treated late is potentially associated with the worst prognosis.

**Case:** A 17-year-old boy was admitted to the hospital due to a distended abdomen and abdominal pain, nausea, and vomiting that he had been experiencing seven days prior. The patient neither had a bowel movement nor flatus for the day. Abdominal ultrasound showed a regional intraluminal mass on the right upper quadrant with a suspicion of an appendical mass with a differential diagnosis of intussusception, colon tumor, and obstructive ileus. Acute abdominal series showed small bowel obstruction. When the surgery was performed, there was a tumor in the hepatic flexure of the colon. Histopathological examination revealed colon adenocarcinoma.

**Conclusion:** The incidence of colorectal cancer in adolescents has increased. Right extended hemicolectomy was performed in this case, but the patient refused the chemotherapy. The patient was readmitted to the hospital five months later, was only given palliative therapy in the Intensive Care Unit, and died two weeks later. We believe that had the chemotherapy been performed, the patient might have had a better prognosis. This case report will help increase awareness among doctors and surgeons in including colorectal carcinoma as a differential diagnosis in adolescents so that it can shorten the delay in diagnosis, which in turn will endanger the patient's prognosis.

**Keywords :** Adenocarcinoma colon, adolescents, bowel obstruction



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## **Introduction**

Colorectal cancer is a malignancy that occurs exclusively in the colon or rectum and is caused by aberrant proliferation of glandular epithelial cells from the colon.<sup>1</sup> It is caused by an interaction between tumor suppressor genes and oncogenes in colorectal carcinogenesis.<sup>2</sup> Colorectal cancer develops when epithelial cells acquire a series of genetic or epigenetic changes that allow them to become hyperproliferative.<sup>3</sup> These rapidly growing cells form benign adenomas, which can develop into cancer and metastasize via several pathways, including microsatellite (MSI), chromosomal instability (CIN), and serrated neoplasia.<sup>4</sup> Cancer begins as a small adenoma that becomes an adenoma giant and, lastly, cancer.<sup>5</sup>

Colorectal cancer is generally considered an elderly disease, with more than 90% of patients diagnosed after age 55.<sup>6</sup> However, the incidence of colorectal cancer in young individuals has increased by 2% to 8% annually over the past two decades.<sup>7</sup> Recent studies have shown that as many as 7% of patients who develop colorectal cancer are under 40 years of age, and this incidence continues to increase.<sup>8</sup> The incidence of colorectal cancer varies across countries, with a higher prevalence in developed countries than in industrialized ones.<sup>9</sup> In the pediatric group aged 20 years, the incidence of colorectal cancer is rare compared to adults. Colorectal cancer can be fatal, but early diagnosis and better management have reduced mortality since the 1980s.<sup>10</sup>

Diagnostic tools for colorectal cancer, including barium enema, abdominal ultrasound examination, colonoscopy, abdominal CT, and therapeutic surgical resection may be performed.<sup>11</sup> However, barium enema takes longer than abdominal CT. Generally, early detection of cancer is difficult.<sup>12</sup>

Treatment of colorectal cancer depends on the stage of cancer.<sup>13</sup> Cancer patients can be treated with surgery and chemotherapy as the first line of therapy. However, patients with metastatic disease historically have a poor prognosis. Surgery with a total resection technique is required in early-stage cases to remove the tumor altogether.<sup>14</sup> Nearly a quarter of colorectal cancer cases are diagnosed at an advanced stage, and 20% of the remaining cases acquire metachronous metastases. Therefore, surgical resection alone is insufficient to reduce colorectal carcinoma mortality.<sup>5</sup> Chemotherapy or radiotherapy can be used before or after surgery to help shrink or stabilize the tumor. Chemotherapy currently consists of single-agent therapy (primarily fluoropyrimidine (5-FU)) and multi-agent regimens, including oxaliplatin (OX), irinotecan (IRI), and capecitabine (CAP or XELODA or XEL). Combined therapy

regimens FOLFOX (5-FU + OX), FOXFIRI (5-FU + IRI), XELOX or CAPOX (CAP + OX), and CAPIRI (CAP + OX) remain the primary approach in first-line treatment.<sup>14</sup>

The prognosis of colorectal cancer patients varies widely between patients, with 5-year survival rates ranging from 90% to 10% depending on the stage and other factors. As much as 35% to 50% of patients have distant metastases at diagnosis, and this can reduce less than 10% of 5-year survival rate. Chemotherapy is used primarily for palliative purposes and increases median survival from 5 to 18 months.<sup>15</sup>

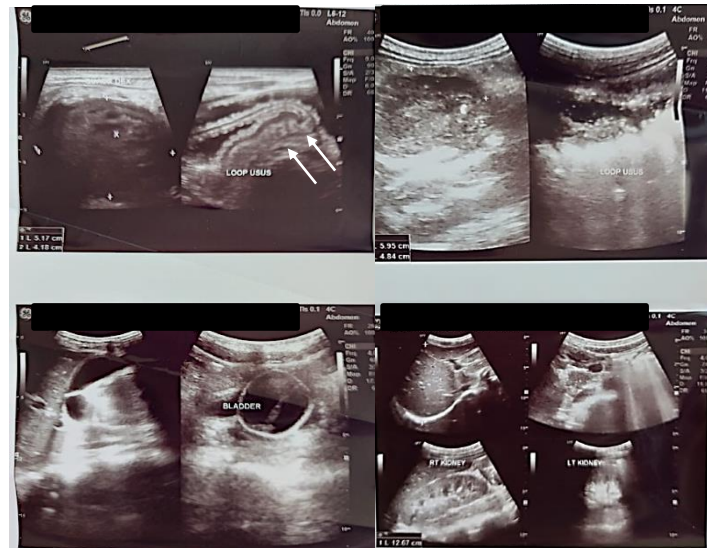
## Case

A 17-year-old boy was admitted to the hospital due to a distended abdomen and abdominal pain, nausea, and vomiting that he had been experiencing for seven days prior. The patient neither had a bowel movement nor flatus for the day, but a day prior, he passed a watery stool with yellow lumps with neither mucus nor blood. The patient also had a history of losing approximately 4 kg over one month. Before the onset of symptoms, there were no signs of malignancy, and he had not had a thorough abdominal examination until then. The physical examination results found that the abdomen was tense all over the abdominal area, distended, and there was generalized abdominal tenderness. Blood examination results showed leukocytosis ( $27.2 \times 10^3$  u/L), decreased hematocrit (37.5 vol%), and increased segmented neutrophils (83%). Initial management was performed on the patient in the emergency room by placing a nasogastric tube and urinary catheter; abdominal ultrasound and an acute abdominal series were scheduled. The abdominal ultrasound showed a regional intraluminal mass on the right upper quadrant with a suspicion of an appendical mass with a differential diagnosis of intussusception, colon tumor, and obstructive ileus (Figure 1). The acute abdominal radiograph showed that intestinal air is minimally distributed to the distal colon, dilatation of intestinal loops, herringbone appearance, and air-fluid level (Figure 2).

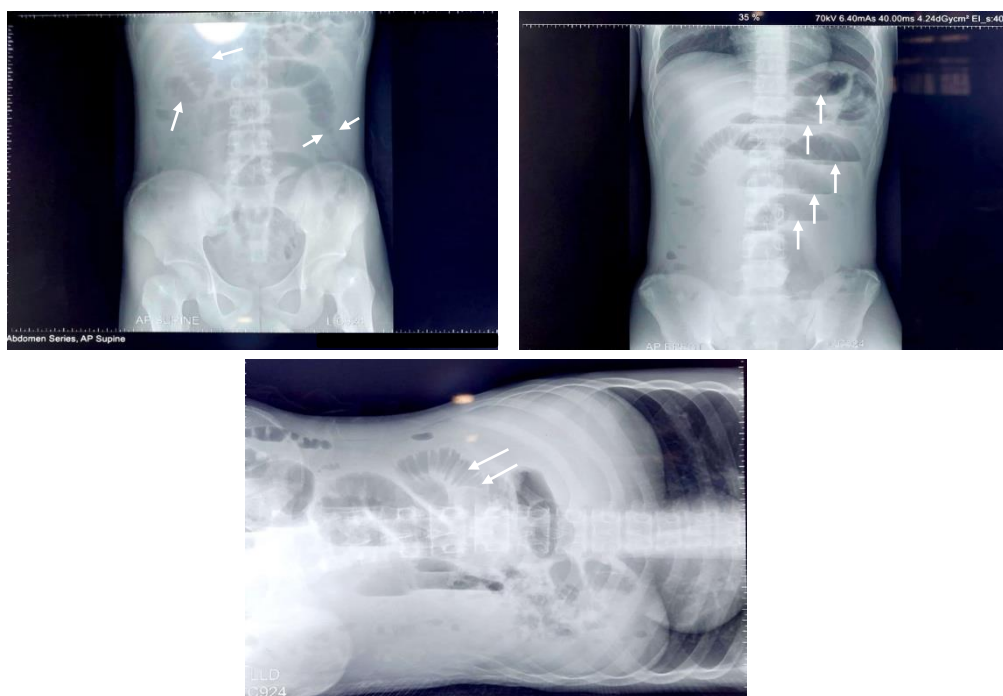
The patient was diagnosed with obstructive ileus caused by suspected perforated appendicitis from anamnesis, physical examination, and diagnostic tests. The abdominal ultrasound examination and acute abdominal series results confirmed the diagnosis. The patient was then scheduled for an immediate exploratory laparotomy.

During the operation, there was dilatation of the colon and a tumor on the hepatic flexure with a size of + 8 x 9 cm, fixed with hard consistency; there were adhesions in the liver and posterior peritoneum. Adhesiolysis was performed, followed by right extended hemicolectomy from the terminal ileum,  $\pm$  20 cm from the ileocecal valve to the transverse colon to the left branch of the middle colic artery (Figure 3). Subsequently, end-to-end

anastomosis was performed between the terminal ileum and the transverse colon. Further exploration of the liver revealed a smooth surface without nodules. After surgery, the patient was diagnosed with Hepatic Flexure Tumor with a suspicion of malignancy. The tumor mass was then examined for histopathological examination.



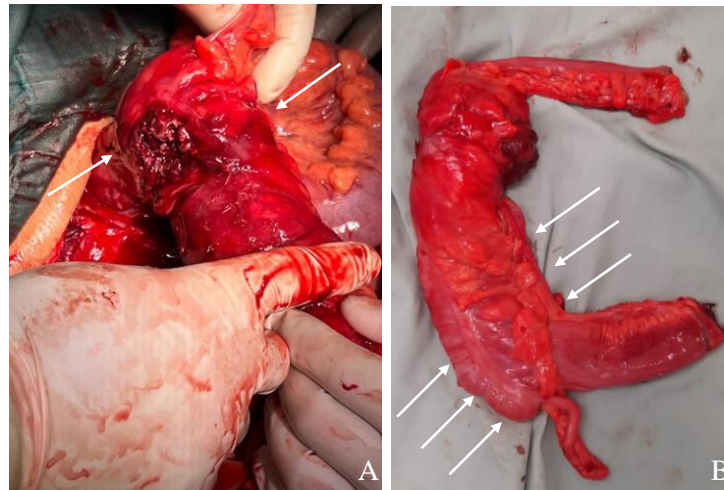
**Figure 1.** The result of the abdominal Ultrasound of the patient.



**Figure 2.** The result of the acute abdominal series from the patient.

After the right extended hemicolectomy, a temporary mild improvement in the patient's condition was reported. The patient was treated for three days in the Intensive Care Unit (ICU) during an 11-day hospitalization. Histopathological biopsy was then performed on

the excised tumor mass, and a week later, the results were colon adenocarcinoma and malignant round cell tumor with a suspicion of poorly differentiated carcinoma with a differential diagnosis of neuroendocrine carcinoma. The patient was then diagnosed with stage III colon cancer with T4aN2bM0. Accordingly, the patient would be referred to the chemotherapy facility, but the patient refused.



**Figure 3.** Tumor on the flexura hepatica of colon. (A) It shows a tumor with a size of  $\pm 8 \times 9$  cm, fixed with hard consistency. (B) Dilatation in the colon.

Five months later, the patient was readmitted with the same complaint. His parents still denied chemotherapy. He was treated at the ICU and was only given control and conservative therapy. The patient died two weeks later after intensive care in the ICU.

### **Discussion**

According to GLOBOCAN 2020 data, colon cancer has the fifth most incidence globally, with 1,148,185 new cases worldwide.<sup>12</sup> In Southeast Asia, the incidence of colon cancer in the standard population is 17.6 per 100,000 in men and 11.6 in women. In Indonesia, the incidence of colon cancer is 34,189 (8.6%) per 100,000 adult population, with a mortality rate of 9.4% of the entire colon cancer cases.<sup>12</sup> Yusuf & Paterasari (2019) reported cases of colorectal cancer in young people aged 24 and 33 years in Bali.<sup>7</sup> Lugito et al. (2014) also reported a similar case in Tangerang, where the patient was 21 years old.<sup>15</sup>

Recent data from the National Cancer Institute (NCI) reveal that there has been an increase in the incidence of colon cancer in young adults.<sup>15</sup> In our case, the affected patients occur very rarely at the age of 17; only a few pieces of literature reported the incidence of colon cancer in adolescents.

In our case, a 17-year-old boy presented with acute abdominal pain, vomiting, and losing 4 kg of body weight over one month. The patient also had no history of malignancy in his family. In our patient, abdominal ultrasound was performed, which showed suspicion of an appendical mass and a colon tumor, followed by an acute abdominal radiograph showing small bowel obstruction. However, in our case, an abdominal CT scan was not performed.

One case of colon cancer at a young age was also reported in Korea by Ahn & Kim (2017). In this case, an 18-year-old girl presented with acute abdominal pain and hematochezia. She had had stomach pains more than thrice and lost 10 kg in the last six months. The patient had no chronic disease or digestive problems before the onset of symptoms and no family history of colon cancer or other malignancies. Plain radiographs showed an ileus state with mechanical obstruction, after which an abdominal CT scan was immediately performed. The CT scan showed adenocarcinoma of the descending colon.<sup>10</sup>

In our case, a CT scan was not performed due to the unavailability of CT scans in our health facility. CT Scans are only available in other provinces, so the patients must be referred. However, a referral was impossible because the patient's condition was an emergency. Common diagnostic methods for colon cancer patients include ultrasound diagnosis, CT scan, and MRI. MSCT has been widely applied because of its power in observing the lesion site.<sup>15-17</sup>

In our case, the patient was diagnosed with stage III colon cancer (T4aN2bM0) after an extended hemicolectomy was performed. He was recommended to be referred to the chemotherapy facility, but the patient refused. The patient was readmitted to the hospital, refused chemotherapy, and was only given control and conservative therapy. The patient died two weeks later after intensive care in the ICU.

Koh et al. (2015) also reported a similar case of colon cancer in Taiwan. In this case, the stage of cancer was T4aN2aM1b. A right hemicolectomy was performed. The patient was then transferred to a pediatric oncology center for chemotherapy with the regimens of bevacizumab and irinotecan and completed the chemotherapy protocol smoothly without any significant complications.<sup>18</sup>

Late diagnosing and treating colon cancer are potentially associated with the worst prognosis.<sup>19</sup> Physical examination, including digital rectal examination, laboratory test, abdominal and pelvic CT scan for colon cancer, high-resolution pelvic MRI for local evaluation of rectal cancer, and colonoscopy, is a crucial standard for establishing the diagnosis.<sup>11,20</sup> Colonoscopy is the recommended examination and is the most sensitive and specific screening test.<sup>21</sup>

Colon cancer cases in adolescents are often diagnosed late because of their rare prevalence.<sup>6,21,22</sup> Based on this, it is necessary to pay attention to the symptoms of colon cancer in adolescents, proper physical examination, and available diagnostic testing facilities so that colon cancer in adolescents can be detected and treated immediately.

### **Conclusion**

Colorectal cancer has the worst prognosis. Therefore, early detection and definitive treatment can increase the possibility of curing cancer. A right extended hemicolectomy was performed in this case, but the patient refused the chemotherapy. The patient was readmitted to the hospital five months later, only given palliative therapy in the Intensive Care Unit, and died two weeks later. We believe that had the chemotherapy been performed, the patient might have had a better prognosis. Early screening for colorectal cancer in Indonesia is still not achieved, especially among adolescents. Given that the prevalence of cancer increases in this age group, it is necessary to pay attention to symptoms in this population and conduct new studies to evaluate the possible benefits of performing early screening to improve the prognosis of colorectal cancer in adolescents.

### **Conflict of interest**

Nothing to declare

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Nothing to declare

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Nothing to declare

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