

Colon carcinoma treated with oxaliplatin and capecitabine in a 12-year-old child

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Background: XELOX (oxaliplatin 130mg/m² iv, capecitabine 1000mg/m² bid oral d1-14, q3w) chemotherapy has never been used in children. In this report, we present a case of a 12-year-old girl with colon adenocarcinoma, treated with surgery and XELOX chemotherapy.

Methods: On admission, the girl complained of abdominal pain and intestinal obstruction. Physical examination revealed a distended abdomen with tenderness on the left upper quadrant. Barium enema revealed a stenotic lesion at the distal end of the transverse colon, and abdominal computed tomography showed acute obstruction and a colonic mass. Laparotomy was performed after the failure of conservative treatment.

Results: The mass was originated from the transverse colon. Frozen sections of the specimens revealed an adenocarcinoma. Transverse colectomy was performed and regional lymph nodes were removed. Pathological examination confirmed that the mass was a poorly differentiated adenocarcinoma, and XELOX chemotherapy was used. No evidence of recurrent or metastatic tumor was found after 18 months.

Conclusion: Although complete resection is the most effective treatment, XELOX chemotherapy is beneficial to the improvement of clinical outcome of patients with colon adenocarcinoma.

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Key words: chemotherapy;
colon adenocarcinoma;
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Introduction

Colorectal cancer (CRC) is an extremely rare tumor in children. Because of this rarity, the role of adjuvant chemotherapy has not been adequately evaluated in children with regard to safety profile and treatment response after application of novel agents.^[1] This report presents a case of a 12-year-old girl with CRC treated with XELOX, i.e. combination of oxaliplatin and capecitabine. This case demonstrates that adjuvant chemotherapy helps to improve prognosis of CRC patients, with a good safety profile without significant adverse effects.^[2,3]

Case report

A 12-year-old girl with complaints of abdominal pain and intestinal obstruction for three days was brought to our department. Clinical examination revealed no palpable mass but pain and tenderness on the left upper quadrant. Hematological tests including biochemistry and serum carcinoembryonic antigen (CEA) showed nothing abnormal. Barium enema revealed a stenotic lesion at the distal end of the transverse colon or an "apple-core" annular lesion (Fig. A). Abdominal computed tomography (CT) demonstrated a mass with a cavity of 6 cm in diameter in the left upper quadrant and the thickened wall of the transverse colon (Fig. B). Conservative treatment was given, but acute obstruction and pain were not relieved. Subsequently, exploratory laparotomy was performed. The mass was found to be originated from the transverse colon and infiltrated in the entire circumference of the bowel wall, where obstruction led to dilation of the proximal transverse colon. During the procedure, frozen sections of the tumor specimens showed an adenocarcinoma. The tumor and its regional lymph nodes were removed. The tumor specimens consisting of an 18 cm long segment of the transverse and descending colon showed an infiltrated circumferential growth measuring 4 cm at the longest axis, located at least 5 cm from the distal resection margin without involvement of the serosa. Pathologic examination revealed a poorly differentiated nonmucinous adenocarcinoma (Fig. C), two negative margins, and 15

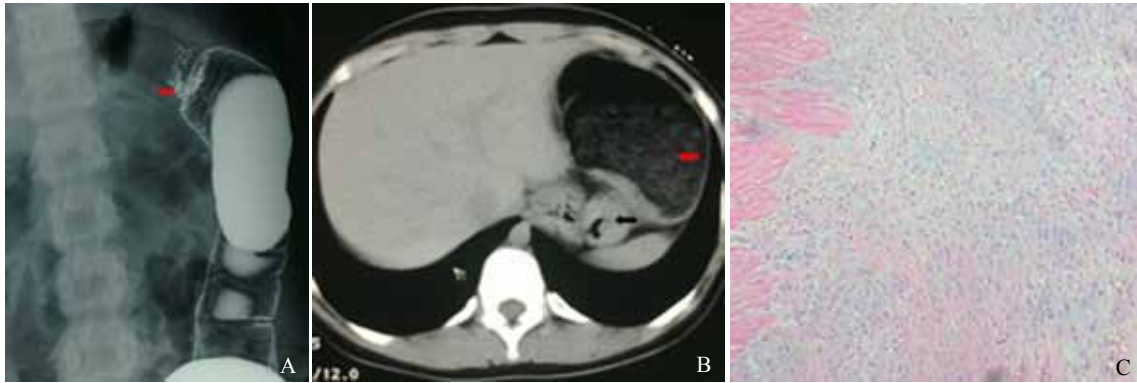


Fig. A: Barium enema showing "apple-core" annular lesions (red arrow) in the transverse colon; **B:** Abdominal CT revealing a tumor in the left upper quadrant (black arrow) and mechanical obstruction of the large bowel are seen (red arrow); **C:** Pathologic and histologic examinations revealing an adenocarcinoma of the colon (H&E staining, original magnification $\times 100$).

positive lymph nodes. Tumor lymph node metastasis classification was T3N2M0 and no complications were observed. Six cycles of chemotherapy were prescribed with a XELOX regimen consisting of 2 cycles of intravenous infusion of oxaliplatin once every 3 weeks in combination with oral capecitabine given on days 1 to 14 of each cycle. During the treatment, the patient was followed up for 18 months. Clinical symptoms, serum CEA, and abdominal CT revealed no evidence of recurrence or metastasis of the tumor. The girl is alive and doing well.

Discussion

CRC is rarely seen in children, with an incidence of only about one per million persons.^[4] Although it has been found in newborns and infants,^[5] the majority of the patients were older than 10 years as reported in the literature.

The clinical manifestations of CRC in children are similar to those in adults, including abdominal pain, weight loss, and change in bowel habits. Acute manifestations were seen more frequently in young children than in adults.^[6] Since conservative treatment fails to improve acute obstruction, it is rational to perform exploratory laparotomy.^[7]

Due to non-specific symptoms and the low level of suspicion, it is essential to perform imaging studies and laboratory tests. Barium enema is more sensitive for the detection of colon lesions.^[8] Abdominal CT scans are effective to assess extramural extension with CRC.^[9] Preoperative colonoscopy is preferred unless acute obstructive carcinoma or other circumstances are not indicated for the procedure. In adults, serum CEA is helpful to detect the occurrence or recurrence of CRC, but it is less likely to be useful in most pediatric cases.^[10] Pre- and post-operation CEA level was within normal limits in our patient.

Due to the lack of prospective studies, it is difficult to detect the benefits of treatments such as surgery and chemotherapy. The benefits of surgery and chemotherapy were identified in some retrospective series.^[2,3] In adults, capecitabine can be safely used in combination with oxaliplatin as proved in the treatment of metastatic CRC.^[11,12] The XELOX regimen significantly improved disease-free survival (DFS) in comparison with 5-FU/LV and demonstrated less frequent grade ≥ 3 toxicity.^[13,14] However, XELOX chemotherapy has never been reported in the literature. Our patient experienced no serious side-effects previously except for neutropenia, nausea and paresthesias.^[15] The use of the XELOX regimen is more advantageous than adjuvant chemotherapy with bolus 5-FU/LV. These benefits include favorable tolerability, patient convenience, nonuse of infusion, ports and pumps, and superiority in DFS. Owing to these benefits, we believe that the XELOX regimen should be the preferred adjuvant treatment of CRC in children and our experience may enrich clinician's knowledge about the application of the agents in children.

Although curative surgery is the most effective treatment for CRC, XELOX chemotherapy is effective in improving the prognosis of the patient with colon adenocarcinoma.

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Ethical approval: Informed consent was obtained from the patient on the day of admission.

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