Chronic Myeloid Leukemia in Patient with Local Recurrence Colon Cancer: A Case Report

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ABSTRACT

Chronic Myeloid Leukemia (CML) is a chronic disease that about 50% of patients are more than 60 years old and about 50% of patients are asymptomatic. In this study, it is reported that, a case of CML after colon cancer chemotherapy in a 52 year old male from Iran who diagnosed locally advanced poorly differentiation colon adenocarcinoma with extension to prostate for him that had undergone to chemotherapy induction, then chemoradiation with surgery for mid-rectal cancer in the follow-up with picture of local recurrence and rectovesical-fistula. His first regimen in induction chemotherapy phase been oxaliplatin plus capecitabine and follow with chemoradiation for one month. The KRAS was mutation for the patient. He treated with combination of capecitabine with bevacizumab. After new progression he treated with Xeloda+irinotecan regimen. In routine follow-up in complete blood count analysis, It was found that shift to left with immature granulocytopenic forms. Analysis by RT-PCR peripheral blood showed that Philadelphia chromosome was positive, so CML was diagnosed for him and was add imatinib to his treatment policy. Combination of oxaliplatin and irinotecan can be carcinogenic even they can probably create secondary hematological malignancy like CML and also irradiation can be other risk factor in patients with colorectal cancer following chemotherapy.

Key words: Chemotherapy, CML, colon cancer, radiotherapy

INTRODUCTION

Cancer is one of the major public health problems in the world. Globally, among common cancers, colorectal cancer is the fourth most common cancer in men and the third most common in women (Payandeh et al., 2015a). On the other hand, therapy-related myeloid neoplasms are one of the most important concerns among oncologists/hematologists (Manabe et al., 2013). Also Chronic Myeloid Leukemia (CML) is a chronic disease that about 50% of patients are more than 60 years old and about 50% of patients are asymptomatic (Payandeh et al., 2015b). The CML is characterized by anemia, extreme blood granulocytosis and granulocytic immaturity, basophilia, often thrombocytosis and splenomegaly (Kadikoylu et al., 2008). There has been a lot of discussion on the likelihood of development of a non-hematological second malignancy in patients with CML.
receiving chemotherapy or other immunosuppressive drugs (Kanellopoulou et al., 2011). In this paper, reported a case of CML after colon cancer chemotherapy in a 52-year-old male from Iran.

CASE PRESENTATION

A 52 year old male referred to our clinic who diagnosed locally advanced poorly differentiation colon adenocarcinoma with extension to prostate for him that had undergone to chemotherapy induction, then chemoradiation with surgery for mid-rectal cancer in the follow-up with picture of local recurrence and rectovesical-fistula. His first regimen in induction chemotherapy phase was oxaliplatin plus capecitabine (Capox) in 3 week treatment cycles: intravenous oxaliplatin 130 mg m$^{-1}$ twice (day 1) followed by oral capecitabine 1,000 mg m$^{-1}$ twice daily (day 1, evening, today 15, morning) to three cycle, that follow with chemoradiation (with XELODA) for one month. After surgery he was treated with three courses of Capox regimen every three weeks. The most common side effect of treatment policy has been diarrhea. In local recurrence phase that was done after six months, KRAS/NRAS was check on the pathology that was KRAS mutation. At this phase, he treated with combination of capecitabine (1000 mg m$^{-1}$ orally twice a day on days 1-14) with bevacizumab (7.5 mg kg$^{-1}$ intravenously on day 1), given every 3 weeks for nearly 8 months with regression of disease, until disease progression. After new progression he was treated with Xeloda plus irinotecan regimen that in radiologic evaluation after three months show to us a sign of stable disease. In routine follow-up in complete blood count analysis, we find shift to left with immature granulocytopenic forms (Fig. 1). Analysis by RT-PCR peripheral blood showed that Philadelphia chromosome was positive, so CML was diagnosed for him and was add imatinib to his treatment policy.

DISCUSSION

Solid tumors may occur in 3% of the patients with CML (Kanellopoulou et al., 2011). It has been reported that mainly elderly patients with hematologic malignancies, including CML are likely to

![Fig. 1: Shift to left with immature granulocytopenic forms in chronic lymphocytic leukemia (×400)](image)
have multiple malignant neoplasms, mainly of the gastrointestinal tract (Kanellopoulou et al., 2011). Only four patients with CML following colorectal treatment were reported that three of them were males and more than 60 years old and another patient also he was male but with 27 years old (Vakili-Sadeghi and Omranpour, 2013). Our patient was a 52 year old male. Therefore, CML after colon cancer accrues more in men and age>50 years. A causal relationship between chemotherapy and the development of Philadelphia chromosome-positive leukemia has been suggested to exist (Pedersen-Bjergaard et al., 1997).

There are three possibilities conditions for secondary malignancy: (1) Therapy-related secondary malignancy, (2) Coincidence and (3) An increased susceptibility to secondary malignancy (Ural et al., 2007) due to the malignant process itself. Although CML accounts for a small percentage of secondary leukemia, reports on treatment-related CML are increasing and several cases of CML in patients treated for thyroid cancers, esophageal, gastric, lung, cervical, malignant fibrous histiocytes and breast cancers have been reported (Vakili-Sadeghi and Omranpour, 2013). Cancer treatment modalities, including radiotherapy and chemotherapy, could themselves increase the risk of developing secondary malignancies (Kadikoylu et al., 2008). NRAS/BRAF mutation probably is effective in treatment of colorectal patients with KRAS wild-type and in patients with KRAS wild-type should be specified NRAS/BRAF testing to determine which patients will benefit from anti-EGFR therapy (Payandeh et al., 2015). Our case was treated with bevacizumab because KRAS mutation. A study (Kadikoylu et al., 2008), reported that 5-flurouracil, oxaliplatin, irinotecan, each of them can be carcinogenic and also in other case report (Vakili-Sadeghi and Omranpour, 2013) the case received these drugs during colon cancer that developed CML. In this study, the patient for colon cancer was treated with capecitabine, oxaliplatin and irinotecan. Radiation as an etiology for CML was known for many years (Lichtman and Liesveld, 2010) but reports have showed that radiotherapy alone (Bauduer et al., 2002), or in combination with chemotherapy (Waller et al., 1999) can cause the second malignancies. Our patient received chemoradiation for one month.

CONCLUSION

Combination of oxaliplatin and irinotecan can be carcinogenic even they can probably create secondary hematological malignancy like CML and also irradiation can be other risk factor in patients with colorectal cancer following chemotherapy. We recommend that blood count analysis in colorectal cancer follow-up (despite a simple test) is very important for diagnosis of malignant hematology disorders.

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