Chronic Myeloid Leukemia After Chemoradiotherapy in a Patient with Non-Small Cell Lung Cancer

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Dear Editor,

Chronic myeloid leukemia(CML) is a myeloproliferative disease characterized by uncontrolled proliferation of mature and maturing granulocytes. Chronic myeloid leukemia accounts for approximately 15 to 20 percent of leukemias in adults. The incidence is 1-2/10000 per year.[1-2] There is only one risk factor, which is ionized radiation.[3] There are some publitions in the literature about CML development after chemotherapy and/or radiotherapy. Here we presented a case that CML occured after chemotherapy concurrent with radiotherapy in non-small cell lung cancer patient.

Sixty year old man who has diagnosed inoperable lung adenocarcinoma in 2013. Carboplatin concurrent with radiotherapy was administered to him. After 2 years follow-up with no progression of disease, the level of leucocyte was started to increase. White blood cell level was 41700/ul, haemoglobin level was 14.3 g/dl and platelet level was 239000/ul. Peripheral blood smear suggested chronic myeloid leukemia. Bone marrow aspiration and biopsy was performed. The biopsy was supported chronic phase chronic myeloid leukemia. Cytogenetic analysis showed %95 translocation (9;22) in 20 metaphasis. BCR-ABL was detected as 60% IS. Sokal, Hasford and EUTOS risk score was calculated high. Imatinib therapy was started as 400 mg/day. Hematologic response was seen 2 weeks after imatinib treatment. After 3, 6, 12 months, BCR-ABL was detected as 27% IS, 1% IS, and 0.4 IS, respectively. The patient is still being followed as remission for both lung cancer and CML.

Secondary cancers are increasing due to increased survival and new treatment outcomes in cancer treatment. Therapy related acute myeloid leukemia and myelodysplastic syndrome are seen at increasing rates.[4] However, therapy related CML (tr-CML) is seen rarely. One study showed that tr-CML developed most often after Hodgkin disease. Less reported after breast cancer, chronic lymphocytic leukemia and seminoma.[5] These diseases may be related to the frequent development of tr-CML, the longer survival of these diseases.

Radiotherapy, chemotherapy and radioactive nuclides used in the treatment cause secondary cancers.[4] It is well known that topoisomerase-II inhibitors and alkylating agents have leukemogenic potential.[5-6] Cancer patients with solid tumors developing tr-CML, used chemotherapies such as cisplatin, bleomycin, cetuximab and 5-fluorouracil. The time range from initial diagnosis of the primary malignancy to tr-CML was about 1 - 16 years in various reports.[6-10] In our case tr-CML developed after 2 years.

Leukoerythroblastic reaction may occur in bone marrow metastasis. If bone marrow metastasis is absent in a patient with leukoerythroblastic reaction, CML should be kept in mind. This case is the first case report of CML development after non-small cell lung cancer treatment in literature.

doi: 10.4999/uhod.172012

The first line of treatment in CML is oral tyrosine kinase inhibitors. The responses are excellent with TKI. As patients with advanced stage CML still have worse prognosis, prevention of disease progression is the most important aspect of CML disease management.[11] Even in the age of strong TKI, accelerated or blastic phase progression reduce the survival significantly. The risk of this progression can be initially reduced by using the second-generation TKI nilotinib and dasatinib. High Sokal risk and complex karyotype in which there is a tendency to use more powerful TKI. Likewise, also in young and low-risk patients with treatment discontinuation future drug candidates may start with second-generation. However, heterogeneous presentation and course of CML, individual characteristics of patients, compliance and preferences, comorbidities, different toxicity profile of the drug, physician-clinic center experience are taken into account in the selection of first-line treatment in the new diagnosis CML.[12-14] Expert opinion on CML treatment; Low-risk chronic phase imatinib 400 mg / day in CML, and second-generation TKIs (dastinib or nilotinib) which are stronger in patients with high Sokal risk.[15] Since our patient has a high Sokal risk score and is a secondary CML, it seems more appropriate to start treatment with second-generation TKI. It is more appropriate to start nilotinib if the administration of dasatinib leads to the development of pleural effusion because the patient has lung cancer. However, due to the repayment conditions in our country, we started imatinib as the first line treatment.

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