Isolated Extramedullary Breast Relapse of Acute Lymphoblastic Leukemia after Stem Cell Transplantation: A Pediatric Case and the Literature Review

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Background: Extramedullary relapse (EMR) in acute lymphoblastic leukemia (ALL) usually occurs in the central nervous system and testes that are known as sanctuary sites. Only a few cases of isolated breast relapse after allogeneic hematopoietic stem cell transplantation (HSCT) have been reported in children. Little is known about the optimal treatment and prognosis of such cases.

Materials and Method: Herein, we report the case of isolated breast relapse in a child with ALL after HSCT along with the literature review of 4 reported pediatric cases.

Results: A 12-year-old girl presented with low grade fever and easy bruising. Her blood count showed: WBC, 124,200/μL; Hgb, 9.5 g/dL; platelets, 43,000/μL. Leukemic cells in the bone marrow aspirates expressed CD34, CD7, CD33, CD117 and cytoplasmic CD3 by flow cytometry. She was diagnosed with early T-cell precursor ALL (ETP-ALL) with no extramedullary involvement. Induction chemotherapy consisting of vincristine, prednisolone, daunorubicin and L-asparaginase (VPDL) failed to achieve a remission. Having achieved a complete remission after the FLAG-IDA (fludarabine, cytarabine and idarubicin) regimen, she underwent an allogeneic HSCT from her HLA-matched sister after 2 more consolidation chemotherapy. Etoposide, cyclophosphamide and total body irradiation (12 Gy) were used for conditioning. Her post-transplant course was uneventful. At 12 months post-transplant, she felt a painless, palpable mass in the right breast. Breast ultrasonography and MRI revealed a 4.2 x 2.3 x 2.6 cm oval, heterogeneously enhancing mass with focal irregular margins located at a 9 o’clock position. Core needle biopsy specimen showed diffuse infiltration of lymphoblastic cells, positive for CD34, CD3, CD7, Ki-67 and TdT. Positron emission tomography-computed tomography (PET/CT) showed a strong fluorine-18 fluoro-deoxy-glucose (F-18 FDG) uptake. She had no evidence of leukemia in her marrow and cerebrospinal fluid. Complete donor chimerism was maintained, and she was diagnosed with isolated EMR of ALL. Currently, she underwent 2 cycles of FLAG-based chemotherapy with reduction of mass, but is waiting for local radiotherapy and subsequent maintenance chemotherapy. Longer follow-up is needed to address the outcome of the case.

Conclusion: Among the 4 reported pediatric cases in the literature, only one was T-ALL, which had a relapse after cord blood transplant in 2nd remission (Howrey, 2000). The other 3 B-ALL cases had poor prognostic factors such as induction failure or second relapse before HSCT (Conter, 1992; Savasan, 1996; Kumar, 2010). The time to breast involvement varied from 8 to 15 months after transplantation. Local radiotherapy was applied in 3 of 4 cases. Accumulation of cases are necessary for guiding the optimal treatment and predicting prognosis in those cases. Clinicians should be aware of the possibility of local relapse in patients with breast lumps even though the bone marrow is in remission.

Keywords: Isolated extramedullary relapse, Breast, Pediatric ALL, Stem cell transplantation