Concurrent Acute Lymphoblastic Leukemia and Low Grade Glioma in an Adolescent

Michael Kim, John Wainwright, George Kleinman, Michael Tobias, Avinash Mohan
Disclosures

• None
Introduction

- Leukemia and primary central nervous system malignancies are the two most common tumors in pediatric patients.
- Acute lymphoblastic leukemia and low grade gliomas are the two most common subtypes.
- Malignancies secondary to radiation therapy or chemotherapy for a primary cancer are a well documented phenomenon.
- The diagnosis of a concurrent leukemia and intracranial tumor in the absence of any genetic abnormalities is limited to a small number of case reports.
Case Report

• A 14-year old male with no past medical history or family history of cancers presented with 3 weeks of fatigue, early satiety, night sweats, and 10 pound weight loss.

• He was found to have hepatomegaly, fever of 103F, and tachycardia to 120s.

• Platelet count was 22, hematocrit 28.2, and white blood cell count of 6.7 with 10% blasts

• Peripheral blood flow cytometry showed atypical B cells
Case Report

- Bone marrow aspirate showed atypical B cell population with 72% blasts
- Lumbar puncture showed no evidence of malignant cells.
- He reported blurry vision with multiple dark spots.
- Ophthalmologic exam showed leukemia retinopathy with Roth spots and retinal hemorrhages.
Case Report

- MRI brain showed a right frontal mass with associated vasogenic edema without contrast enhancement.
- He underwent an excisional biopsy of the mass to determine if it was CNS involvement of the leukemia or a primary CNS neoplasm.
Case Report

- Pathology was a diffuse astrocytoma, IDH-1 mutant, WHO grade II
- 100% immunopositive for glial fibrillary acidic protein
- Ki-67 labeling 5-10%
- P53 labeling 20-30%
Case Report

• His chemotherapy regimen consisted of induction chemotherapy with vincristine, intrathecal methotrexate, intrathecal cytarabine, daunorubicin, and pegylated asparaginase with consolidation chemotherapy of vincristine, methotrexate, cytarabine, cyclophosphamide, mercaptopurine, and pegylated asparaginase. He then received four more cycles of vincristine and high dose methotrexate.

• He currently remains in remission of both cancers.
Discussion

• Leukemia represent 30% of all pediatric cancers.
• CNS tumors are the most common solid tumor.
• The presence of both leukemia and an intracranial tumor is limited to 4 case reports of patients aged 2-6, each with acute lymphoblastic leukemia, but different intracranial tumors.
  • Cerebellar juvenile pilocytic astrocytoma
  • Craniopharyngioma
  • Pontine glioma
  • Cerebellar gemistocytic astrocytoma.
Summary Point

• Leukemia and primary CNS tumors are the two most common malignancies in the pediatric population.
• Malignancies that occur secondary to chemotherapy or radiation for the primary cancer are well documented.
• The presence of two concurrent cancers is rare and limited to a small number of case reports in the pediatric population.