ISOLATED CNS RELAPSE DESPITE SYSTEMIC CR FOLLOWING EXTRAMEDULLARY DISEASE IN PRIMARY PLASMA CELL LEUKEMIA

Sabaa Saad-Omer[1], Ali Baloch[2]
[1,2]Cook County Health and Hospital Systems, Chicago, IL, USA

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INTRODUCTION

Primary plasma cell leukemia (PCL) is a rare and aggressive plasma cell neoplasm associated with frequent extramedullary involvement, which is associated with worse outcomes. CNS involvement is rare but carries an extremely poor prognosis, and isolated CNS sanctuary-site progression despite systemic remission remains poorly characterized. (1)

AIM

To describe isolated leptomeningeal relapse despite systemic remission in primary plasma cell leukemia and highlight diagnostic and therapeutic challenges of CNS involvement.

CLINICAL CASE

A 45-year-old female with transplant-ineligible lambda light-chain primary plasma cell leukemia achieved complete systemic response (CR) following isatuximab-based quadruplet induction and maintenance therapy.

One month after initiation of maintenance Isa-Pom, she relapsed with diffuse lymphadenopathy, pleural effusion, ascites, and biopsy-confirmed extramedullary plasma cell neoplasm demonstrating lambda restriction, Ki-67 >90%, c-Myc positivity, and p53 positivity consistent with highly aggressive biology.

She received cytoreductive VD-PACE for relapsed triple-class-exposed disease with normalization of serum studies, disappearance of monoclonal protein on SPEP/IFE, near-normal free light chains, and resolution of PET-avid extramedullary disease. BCMA-directed bispecific therapy was planned.

Three weeks after cycle 2 VD-PACE, she was admitted with altered mental status. MRI brain demonstrated extensive leptomeningeal disease, while CSF analysis revealed pleocytosis, elevated protein, and malignant plasma cells. Systemic markers remained suppressed with negative SPEP/IFE and near-normal serum FLC ratio, suggesting isolated CNS relapse despite systemic remission.

She received intrathecal methotrexate, cytarabine, and hydrocortisone with subsequent CSF clearance and radiographic improvement, followed by whole-brain radiation. Bispecific therapy was deferred because of concern for overlapping neurotoxicity. Despite transient CNS response, rapid systemic relapse and clinical decline developed.

Planned BCMA-directed therapy could not be initiated because of rapid deterioration, and she ultimately transitioned to comfort-focused care.

CONCLUSIONS

1. CNS sanctuary-site progression in PCL may occur independently of systemic disease burden despite apparent systemic remission.

2. Early CNS evaluation should be considered in high-risk PCL with extramedullary disease and aggressive biologic features.

3. Outcomes remain poor in relapsed PCL with CNS involvement, highlighting the need for integrated CNS-directed and systemic therapies.

CONTACT INFORMATION

sabaa.saad@cookcountyhealth.org

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