Bone Marrow Wars: Attack of the Clones

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INTRODUCTION

Multiple myeloma is characterized by the malignant proliferation of clonal plasma cells producing monoclonal paraproteins, leading to multi-organ damage. On the other hand monoclonal B-cell lymphocytosis (MBCL) is characterized by the malignant proliferation of clonal B-lymphocytes, with potential to develop into chronic lymphocytic leukemia (CLL) or small lymphocytic lymphoma (SLL). CLL/SLL can result in visceromegaly, anemia, thrombocytopenia, fevers, night sweats and unintentional weight loss. Literature review demonstrates these two malignant clonal bone marrow disorders are most frequently seen independently in patients[(1)]; however, we report one rare diagnostic challenge where both clonal disorders were identified in a single patient concurrently.

CASE DESCRIPTION

A 64-year-old man initially presented with worsening back pain. Thoracic spine x-ray revealed a T11 compression fracture, confirmed by magnetic resonance imaging.

CASE DESCRIPTION (continued)

Complete blood count revealed a white blood cell count of 7.3 K/uL with 54% lymphocyte predominance and peripheral smear demonstrated a population of small lymphocytes with round nuclei and an atypical chromatin pattern suggestive of CLL/MBCL. Flow cytometry revealed a monoclonal B-cell CD5 positive, CD23 positive, CD10 negative population with an absolute count of 1.6 K/uL. Due to the instability and pain associated with the spinal fracture, patient had kyphoplasty performed and intraoperative bone biopsies were taken from both T11 and T12 vertebrae. Interestingly each bone biopsy revealed involvement by both a kappa-light chain restricted plasma cell neoplasm, ranging from 15% to 30% cellularity, as well as a CD5-positive B-cell lymphocyte population. It suggested two concurrent but pathologically distinct pathologies including plasma cell myeloma and a separate B-cell lymphoproliferative disorder with immunophenotypic features suggestive of CLL/MBCL. Bone marrow biopsy was performed for definitive evaluation and confirmed multiple myeloma with 15-20% kappa-restricted plasma cells identified, and also confirmed concurrent MBCL with CD5 and CD23-positive, kappa-restricted B-cells identified on bone marrow flow cytometry. Adding an additional layer of complexity, bone marrow molecular genetics revealed presence of a MYD88 mutation, raising concern for possible lymphoplasmacytic lymphoma (LPL). However, secondary pathologic review ruled out LPL, as the immunophenotypic pattern of the clonal B-cells was not consistent with that of LPL, and although the MYD88 mutation is predominantly seen in LPL, it has also been seen in a small percentage of CLL/SLL cases and exceedingly rarely described in MM as well. Serum protein electrophoresis with immunofixation, serum quantitative immunoglobulins and serum quantitative free light chain assay revealed findings consistent with IgG kappa multiple myeloma and systemic CT imaging was negative for any lymphadenopathy, confirming MBCL. Patient was started on first-line multiple myeloma systemic therapy for transplant eligible patients and has demonstrated an excellent response to treatment thus far.

DISCUSSION

This patient case serves to demonstrate the importance of maintaining a broad differential when approaching hematological problems; It also underlines the necessity for a complete diagnostic evaluation to identify rare clinical conundrums such as with our patient, allowing for proper and timely treatment. While we use “Occam’s razor” to explain multiple problems with a single unifying diagnosis, the rare possibility of divergent diagnosis is to always be entertained.

REFERENCES

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