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Case Report
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Multiple Myeloma with Central Nervous System Involvement and Peritoneal Metastasis: A Case Report

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Abstract

Multiple myeloma is a hematologic malignancy primarily affecting plasma cells within the bone marrow and extramedullary tissues. Although extramedullary spread can occur, intrathecal involvement to the Central Nervous System (CNS) is exceedingly rare and poses serious diagnostic and therapeutic challenges. We present a case study of multiple myeloma with central nervous system involvement and peritoneal spread.

Patient is a 64-year-old male with history of multiple myeloma with IgG kappa light chain restriction diagnosed in 2010 status post autologous stem cell transplant over ten years ago, and peritoneal metastasis three years ago. The patient recently presented to the emergency department with lower limb pain, progressive weakness, and confusion. Lumbar puncture was performed, and cerebrospinal fluid was sent for cytology. Microscopic examination of the cerebrospinal fluid showed malignant plasma cells. The patient subsequently treated with biweekly intrathecal chemotherapy.

Keywords: Myeloma; Peritoneal Metastasis; Cytology; Bone Marrow

Introduction

Patient is a 64-year-old male with history of multiple myeloma with IgG kappa light chain restriction diagnosed in 2010 status post autologous stem cell transplant over ten years ago, and peritoneal metastasis three years ago. The patient recently presented to the emergency department with lower limb pain, progressive weakness, and confusion. Lumbar puncture was performed, and cerebrospinal fluid was sent for cytology. Microscopic examination of the cerebrospinal fluid showed malignant plasma cells. The patient subsequently treated with biweekly intrathecal chemotherapy.

Case Presentation

A 64-year-old male patient presented bilateral lower extremity pain, progressive weakness, and confusion. Serum electrophoresis and immunofixation study showed a monoclonal protein with IgG kappa light chain restriction, and M-spike of 10.2% and 0.53 g/dL. Lumbar puncture was performed at the hospital admission. Cerebrospinal Fluid (CSF) was sent to the laboratory for microscopic examination. Scattered atypical plasma cells and some with binucleations were identified in the CSF specimen (Figure 1). The concurrent flow cytometry demonstrated the plasma cells were positive for CD138, CD38 dim, CD117, and cytoplasmic immunoglobin kappa light chain (Figure 2), and negative for CD19, CD20, and CD56. The patient then received intrathecal chemotherapy with triplet of intrathecal therapy (hydrocortisone, methotrexate, and cytarabine).

The patient had also presented peritoneal masses three years ago, and history of multiple

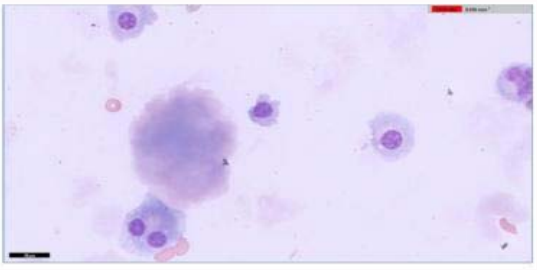

Figure 1: Cerebrospinal fluid cytology showing scattered atypical plasma cells, some with binucleation, consistent with leptomeningeal involvement by multiple myeloma.

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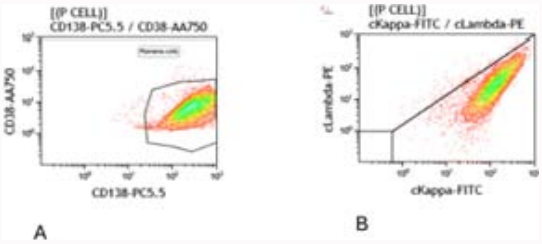

Figure 2: Flow cytometric analysis of the cerebrospinal fluid demonstrating a clonal plasma cell population positive for CD138, CD38 (dim), CD117, and cytoplasmic kappa light chain, and negative for CD19, CD20, and CD56, supporting CNS involvement by IgG kappa multiple myeloma.

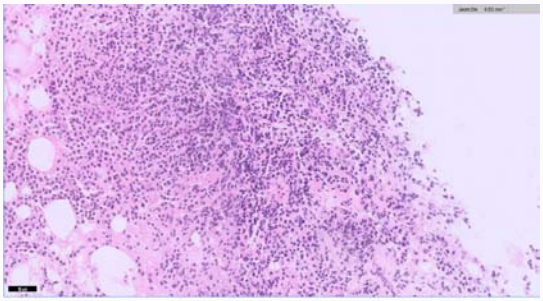

Figure 3: Core biopsy of the retroperitoneal mass showing sheets of atypical plasma cells diagnostic of extramedullary plasmacytoma.

myeloma status post autologous stem cell transplant. Abdomen pelvis CT study at that time demonstrated a large enhancing mass measuring 8.6 cm × 5.6 cm × 9.3 cm inseparable from the inferior vena cava and which closely abuts against half the circumference of the abdominal aorta. This measures 8.6 cm × 5.6 cm × 9.3 cm. More inferiorly there is an additional mass measuring 3.9 cm × 2.5 cm × 8 cm within the right hemipelvis which extends into the superior most right sacral foramen. Core biopsies of the retroperitoneal lesions were diagnostic of extramedullary plasmacytoma (Figure 3). study demonstrates a kappa light chain-restricted clonal plasma cell population that is positive for CD138, CD56, CD117, MUM1, CD20 (very small subset) and negative for CD3, CD21, PAX5, BCL-1, AE1/3. These findings represented peritoneal metastasis in a patient with history of multiple myeloma.

Discussion

Extramedullary Disease (EMD) occurs in up to 5% of multiple myeloma patients, arising via hematogenous spread or through the bone cortex into contiguous tissues [1]. It can occur in the skin, lymph nodes, abdominal organs, upper airway and the Central Nervous System (CNS) [2].

We reported a case of multiple myeloma patient with Central Nervous System (CNS) involvement and peritoneal metastasis. Multiple myeloma patients with CNS involvement typically present with neurologic symptoms such as radiculopathy, cranial nerve deficits, or signs of leptomeningeal disease. Diagnosis is made by Cerebrospinal Fluid (CSF) examination for malignant plasma cells, along with neuroimaging for assessment of CNS involvement.

A Multiple Myeloma (MM) patient with Central Nervous System (CNS) involvement and peritoneal metastasis is a rare but aggressive complication with a poor prognosis, often requiring a combination of treatments including systemic chemotherapy, High-Dose Systemic Therapy, Autologous Stem Cell Transplantation (auto-HSCT), intrathecal chemotherapy, whole-brain radiation, and potentially newer therapies like CAR-T cell therapy [3]. The presence of both CNS and peritoneal metastasis indicates Extramedullary Disease (EMD), which is associated with a worse outcome and can affect various organs, requiring careful evaluation and aggressive, multi-modal treatment strategies [4].

References

1. Nieuwenhuizen L, Biesma DH. Central nervous system myelomatosis: review of the literature. Eur J Haematol. 2008;80(1):1-9.
2. irumani SH, Shinagare AB, Jagannathan JP, Krajewski KM, Munshi NC, Ramaiya NH. MRI features of extramedullary myeloma. AJR Am J Roentgenol. 2014;202(4):803-10.
3. Egan PA, Elder PT, Deighan WI, O'Connor SJM, Alexander HD. Multiple myeloma with central nervous system relapse. Haematologica. 2020;105(7):1780-90.
4. Ahmadi SE, Rahimi S, Zarandi B, Chegeni R, Safa M. MYC: a multipurpose oncogene with prognostic and therapeutic implications in blood malignancies. J Hematol Oncol. 2021;14(1):121.