Abstract

Extramedullary disease (EMD) is an uncommon condition in patients with multiple myeloma (MM), since extramedullary spread of MM is associated with an aggressive course and a poor prognosis. Moreover, the mechanism of EMD development is uncertain. Here, we present a case of extramedullary plasmacytoma occupying the left upper limb of a 66-year-old female patient with MM, and we describe the clinical features of EMD in MM.

Case Report

A 66-year-old woman developed pain in her left shoulder and was diagnosed with pathological fracture. Her serum IgG was elevated to 3811 mg/dL and IgG-lambda type M-protein was detected by serum immunoelectrophoresis assay. She had 19.6% of bone marrow plasmacytosis with normal cytogenetics. The diagnosis of ISS stage 1 IgG-lambda type MM was established. No other bone lesion, anemia or kidney injury was found. Her left upper extremity was treated with 8 Gy single fraction using a 4MV photon beam by parallel opposed portals, prior to the conventional vincristine/adriamycin/dexamethasone (VAD) induction therapy. After the three courses of VAD treatment, she was switched to a bortezomib/dexamethasone (BD) regimen because of a Helicobacter cinaedi bacteremia developed in the third course of VAD. After the completion of 3 courses of BD regimen, her bone marrow plasmacytes was decreased to 0.4%, however, a tumor of 1 × 1 cm large developed in her left arm. With a clinical diagnosis of extramedullary plasma cell tumor, second course of radiotherapy with 8 Gy irradiation (left upper extremity) was performed, after which the patient underwent lenalidomide/dexamethasone therapy. Lenalidomide/dexamethasone was effective, and her EM nodule decreased in size to visually undetectable level; however, 6 months later, after 4 courses of Lenalidomide/dexamethasone treatment the nodule enlarged again. There were 15 × 15 mm tumor in flexor side of her left arm and 20 × 20 mm tumor in her extensor side of forearm. MRI revealed those tumors were not connected to cortical bones, in addition, no other tumors in her left arm were found. A needle biopsy of a tumor in her left arm was performed and an accumulation of atypical plasmacytes were detected. As a third line therapy, 2 courses of bortezomib/cyclophosphamide/dexamethasone regimen, followed by melphalan/thalidomide/prednisolone (MPT) was administered, however, during the 6th course of MPT, the extramedullary plasmacytoma occupied her left upper limb.

Then, pomalidomide/dexamethasone as a fourth line was started, which was initially effective; the size of the tumor mass decreased, and the vessels on the surface of the bulk of the tumor appeared to be reduced. However, in the 3rd course of pomalidomide treatment, the EMD enlarged again and extended to her left forearm and back of the hand (Figure. 1). On the contrary, there were only scarce MM cells in the bone marrow (3.6%). Those MM cells were morphologically plasmablastic and harbored complex cytogenetic abnormality. She died of severe respiratory failure. Pleural and pulmonary tumor infiltration was suspected. Post-mortem examination revealed extensive MM involvement of multiple organs, including not only the left upper limb, but also lung, liver, kidney,
stomach, and thyroid (Figure 2). However, the bone marrow had only scattered patchy myeloma cells.

**Discussion**

We demonstrate a remarkably large plasmacytoma developing in the left arm of a patient with refractory MM. The presence of this large extramedullary plasmacytoma may be rare; so far, no cases of EMD of a similar size have been reported.

Consistent with prior reports, the patient had plasmablastic MM cells, complex karyotype, elevated LDH, and presented a very aggressive course. Although MM cells were seen to invade multiple organs, including lung, liver, and kidney, there was no evidence of plasma cell leukemia, and only 3.6% bone marrow plasmacytosis was detected. This dissociation between bone marrow and peripheral blood findings and aggressive visceral organ invasion may be significant. In the courses of the pomalidomide treatment, the vessel pattern in the bulk of the tumor had reduced. This is compatible with the widely recognized phenomenon that IMiDs antagonize tumor angiogenesis.

**Conclusions**

We discussed an extremely large EMD developing in a patient with refractory MM. MM cells extensively invaded multiple organs without significant bone marrow infiltration. This case may provide clues for a better understanding of the EMD.

**References**

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