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# Auer Rod-like Inclusions in a Patient with Multiple Myeloma

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A 79-year-old man was admitted to the hematology department for an 11-month history of bone pain in the spine and pelvis, along with generalized fatigue and lethargy. He had no significant personal or family history. On general examination, he was afebrile and normotensive, with pale skin. Physical examination only revealed diffuse bone pain on palpation. His initial laboratory investigations portrayed a normocytic normochromic anemia with a hemoglobin level of 70 g/l and high levels of serum viscosity and C-reactive protein (100 mm/H and 80 mg/l, respectively). Further laboratory findings were deemed normal, including serum creatinine, 24-h urine protein, and serum calcium levels. The patient also had elevated levels of beta-2 microglobulin (8 mg/l), lactate dehydrogenase (500 IU/l), total protein count (100 g/l), and albumin (28 g/l). Serum protein electrophoresis and immunofixation confirmed a monoclonal band of immunoglobulin (Ig)G kappa clonality, and the serum-free light-chain kappa/lambda ratio was 331. Moreover, his karyotype and fluorescence in situ hybridization were normal. The skeletal magnetic resonance imaging revealed various spinal osteolytic lesions. The bone marrow aspiration showed mature and dystrophic plasma cells at 68%. Most notably, the latter contained Auer rod-like inclusions in some of the plasma cells (Figure 1). These inclusions were morphologically needle-shaped resembling faggot cells (Figure 2). The diagnosis was subsequently confirmed given all the aforementioned information and the updated criteria of the International Myeloma Working Group. The patient received six cycles of bortezomib, lenalidomide, and dexamethasone (VRD protocol) and achieved complete remission. Currently, he is under maintenance chemotherapy with lenalidomide.

In addition to the classic morphological variations, several nuclear and cytoplasmic inclusions have been reported in multiple myeloma. Auer rod-like inclusions, which are essentially composed of crystallized lysosomal enzyme depositions, are one of these rare features, and the underlying pathogenesis is still unknown. In addition, differentiating these structures from Auer rods seen in immature myeloid cells morphologically remains challenging. To the best of our knowledge, all previous cases reporting the presence

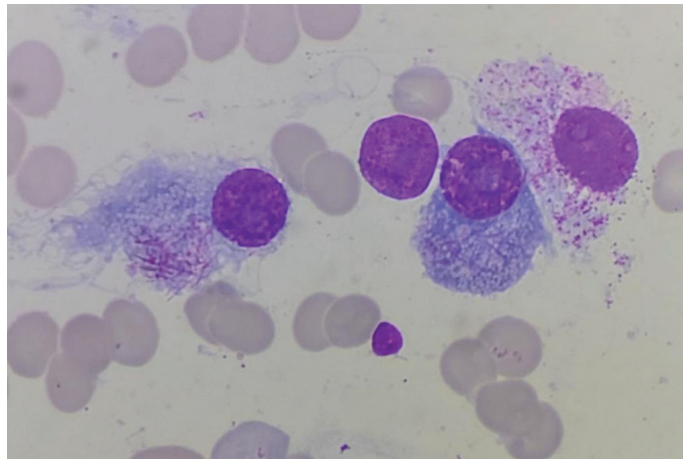

**FIG. 1.** Bone marrow smear: dystrophic plasma cells with intracytoplasmic Auer-rod like needle-shaped crystalline inclusions (MGG coloration x1000).
MGG, may-grünwald giemsa

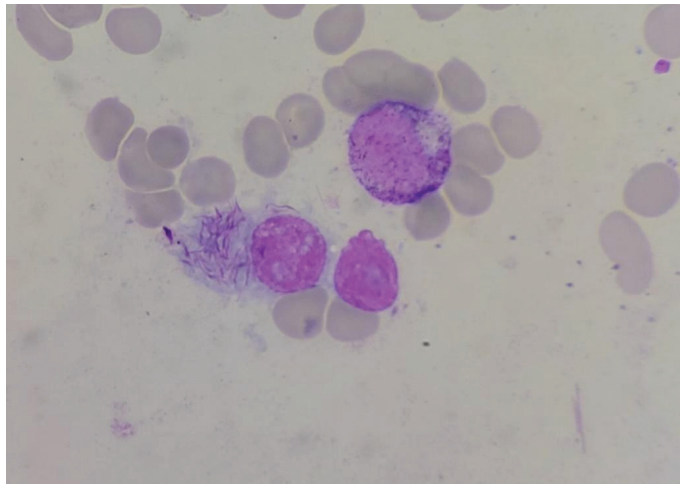

**FIG. 2.** Bone marrow smear: intracytoplasmic inclusions looking like faggot bodies (MGG coloration x1000).
MGG, may-grünwald giemsa

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of Auer rod-like inclusions in patients with multiple myeloma confirmed this phenomenon to be primarily limited to patients with IgA- or IgG- and kappa-secreting myelomas. This was also the case of our patient.[1-3] Therefore, careful examination of these inclusions is necessary. Conducting a panel of cytochemical tests, detailed history, examination, laboratory investigations, and other biochemical tests is important to avoid misdiagnosis and distinguish it from true Auer rods seen in myeloid progenitors.

**Informed Consent:** Written informed consent was obtained from the patient.

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