Plasma cells with hairy projections and Auer rod-like inclusions in a patient with multiple myeloma

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DESCRIPTION

A 38-year-old woman presented to the outpatient clinic with complaints of easy fatiguability and bone pains for 1 month. On investigating, she was found to have plasma cell (PC) neoplasm of IgA-kappa type with 91% PCs in bone marrow and 5% in peripheral blood (PB). Apart from PCs with classical morphology, there were PCs with distinct circumferential hairy cytoplasmic projections (figure 1) and a few others showing bulbous projections (figure 2). Bone marrow showed Auer rod-like inclusions in some of the PCs (figure 3) and rare histiocytes showing ingested Auer-rod like inclusions (figure 4). She was given two-drug combination chemotherapy (thalidomide and dexamethasone) because of financial limitation. During the second cycle of chemotherapy, she developed generalised weakness and shortness of breath. At this point, the PB smear revealed 27% PCs with cells having hairy projections. Flow cytometry revealed these cells to have immunophenotype of aberrant PCs (positive for CD38, CD138, CD200, CD28 and dim CD45 with cytoplasmic κ light-chain restriction and negative for CD19, CD56, CD81 and CD27), consistent with PC leukaemia. Triple-drug combination chemotherapy (cyclophosphamide, bortezomib and dexamethasone) was started and the patient improved. Currently, she is receiving eighth cycle of chemotherapy with a very good partial response.

PC leukaemia with hairy projections on PCs can masquerade as hairy cell leukaemia and can be morphologically misleading.[1] However, ancillary techniques like flow cytometry help resolve

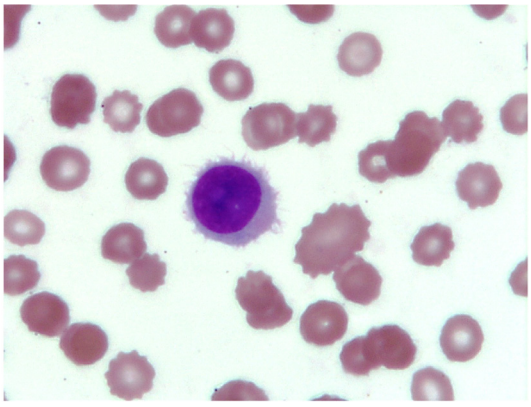

Figure 1 Circulating PC with distinct circumferential hairy projections (Leishman stain ×400). PC, plasma cell.

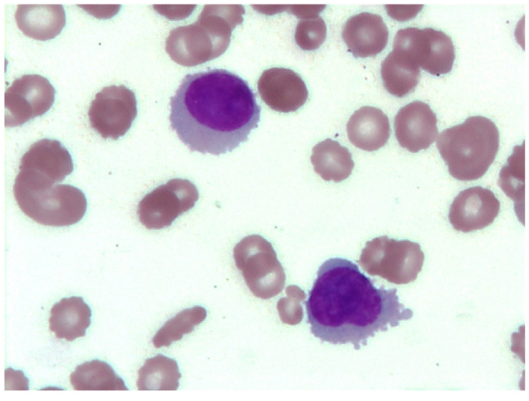

Figure 2 Few other PCs showing cytoplasmic blebs (Leishman stain ×400). PCs, plasma cells.

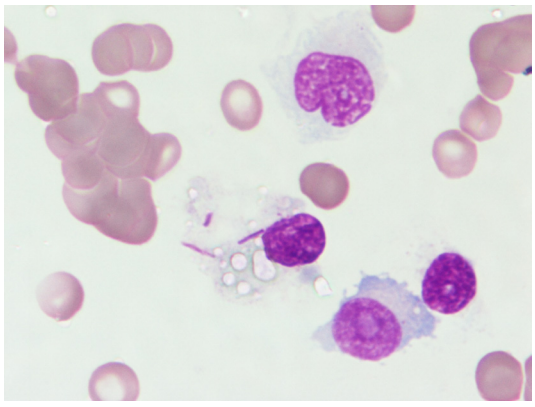

Figure 3 Bone marrow showing a PC with Auer rod-like inclusions (May-Grunwald Giemsa ×400). PC, plasma cell.

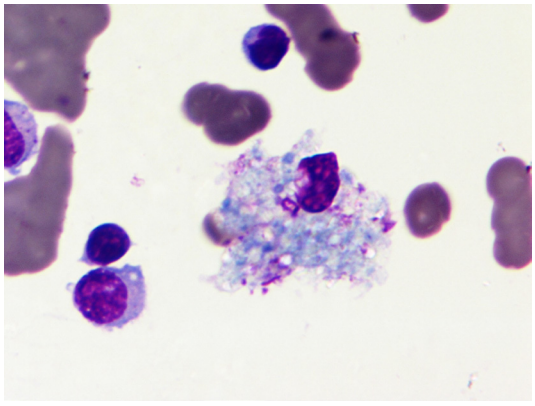

Figure 4 Bone marrow showing a histiocyte with ingested Auer rod-like inclusions and cellular debris (May-Grunwald Giemsa ×400).

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such confusion with specific immunophenotypic characteristics. PCs with Auer-rod like inclusions are rarely described and although these inclusions demonstrate a close relationship with the Auer rods of myeloid cells, it is proven that the inclusions in PCs are composed of typical PC lyzosomal enzymes such as acid phosphatase, α-N-esterase or β-glucuronidase rather than myeloperoxidase or chloroacetate esterase of myeloid cells.[2] Although the prognostic information of the presence of such Auer-rod like inclusions is not exactly determined, they are correlated with κ-chain myelomas and adult Fanconi syndrome.[3] A correlation with the former was noted, however, adult Fanconi syndrome was not seen in the index case.

Learning points

- Plasma cells can have protean morphology including cytoplasmic hairy projections which a haematopathologist must be aware of, and this case emphasises that plasma cell leukaemia should be considered in the morphological differential diagnosis of hairy cell leukaemia. Ancillary techniques help significantly avoid misdiagnosis in cases where morphology is misleading.
- Plasma cells can have Auer-rod like inclusions, which are crystalline deposits of lyzosomal enzymes and completely different from intracytoplasmic immunoglobulin crystals. They are postulated to correlate with k-chain myelomas and adult Fanconi syndrome; however, their exact prognostic relevance is yet to be established.

Contributors PS: preparation of the manuscript and acquisition of data. JA and MUSS: idea and final approval of manuscript, reported the case and involved in workup of the case. PM: provided the clinical data, follow up of the patient and approved the manuscript.

Competing interests None declared.

Patient consent Obtained.

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