Multiple myeloma with numerous intranuclear Russell bodies

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A 71-year-old woman was admitted to hospital because of repeated episodes of epistaxis and an eight month history of fatigue and weight loss. On physical examination she appeared pale. Hemoglobin level was 72 g/L, the WBC count 5.6×10^9/L and the platelet count 300×10^9/L. A peripheral blood smear revealed normochromic anisocytosis and rouleaux formation, and 2% plasma cells. The ESR was 166 mm in the first hour. Serum protein level was 103 g/L with a homogeneous component of 36 g/L on the γ-globulin peak. Serum level of IgG was 3099 mg/dL, of IgA 11 mg/dL and of IgM 18 mg/dL. Immunoelectrophoresis showed a monoclonal IgG-κ in serum and κ light chains in urine. The bone marrow aspirate demonstrated 72% moderately undifferentiated plasma cells, some of them binucleated. There were Russell bodies (RB) in 32% of the plasma cells, their location being cytoplasmic in 5%, intranuclear in 26% and both cytoplasmic and nuclear RB in 1%. Of these plasma cells containing RB, 8% had from 7 intranuclear inclusions (Figures 1 and 2) up to 31 inclusions, 10% had between 4 and 6 and 82% had fewer than 4. The intranuclear RB were negative for myeloperoxidase, Sudan black B, periodic acid-Schiff, acid phosphatase, β-glucuronidase, non-specific esterases (α-naphthyl-acetate-esterase), methyl green pyronine and Perls' stain. The bone marrow biopsy showed a diffuse plasma cell infiltration. Plasma cell RB stained red for Masson's trichrome. This ultrastructural study proved the inclusions to be RB, characterized by homogeneous material bound by a single membrane (Figure 3) located in the rough endoplasmic reticulum (RER) and mainly within the nucleus. The patient was treated with intermittent courses of melphalan and prednisone, achieving partial remission and remaining alive at 21+ months.

RB, composed of protein, are situated in dilated RER cisternae. In rare cases of multiple myeloma, RB are found within the cell nucleus, surrounded by a

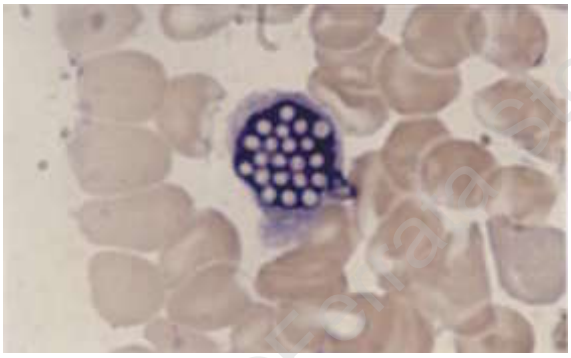

Figure 1. Bone marrow (MGG, ×1000). A myelomatous plasma cell showing 21 intranuclear inclusions that almost entirely occupy the nucleus; thus, naming it as a morular-nucleus cell resembling the Mott cell cytoplasm appears appropriate.

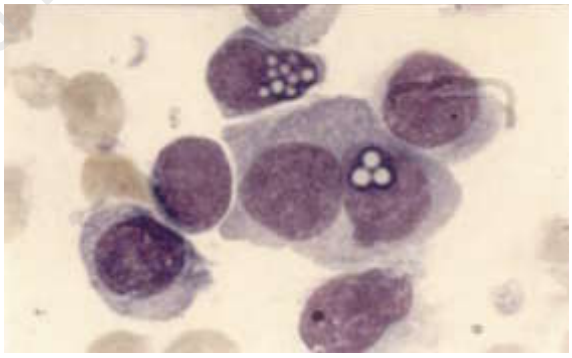

Figure 2. Bone marrow (MGG, ×1000). Cluster of plasma cells, one of which has 9 inclusions partially covering the nucleus, together with a binucleated cell displaying 3 inclusions within one of the nuclei.

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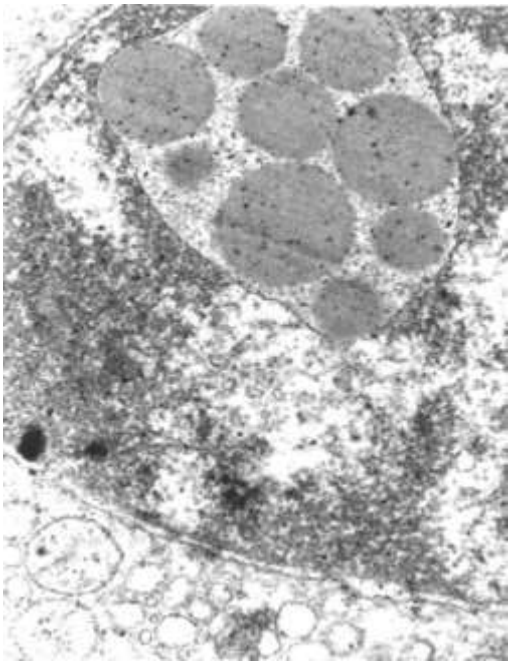

Figure 3. Bone marrow (electron microscopy, ×29,700). Ultrastructural detail of a plasma cell containing 9 intranuclear globulose structures which show homogeneous electron-density, resembling RB surrounded by a single layer membrane

single membrane,[1-4] thus supporting the idea that immunoglobulin deposition has occurred at the level of perinuclear cisternae. Malignant plasma cells containing intranuclear inclusions are infrequent so that the presence of such numerous inclusions is exceptional. We could have named these intranuclear inclusions *Dutcher bodies*[5] but this terminology is now held to be inappropriate and according to Gadhially[6] the term *Dutcher body* should be replaced by the more correct *intranuclear Russell body*.

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