ENIGMATIC MORPHO INSIGHT

BIZZARE PLASMA CELL – MOTT CELL

Mott cells are plasma cells that have spherical inclusions packed in their cytoplasm.

The term 'Mott cell' is named after a surgeon, F. W. Mott, who identified these cells in the brains of monkeys with trypanosomiasis (1901). He termed it morular cell (from the Latin morus, mulberry) and recognized these cells to be plasma cells and therefore indicative of chronic inflammation. Although his name has been attached to the cell, Mott was not the first to describe this appearance. The first description was most likely by William Russell in 1890, however he neither recognized the nature of the cell nor the significance of the inclusions.[1]

The hand-drawn illustration of Mott cell reveals multiple varied size spherical inclusions/ Russell bodies within a single plasma cell having an eccentrically placed clock face nucleus [Figure 1].

The photomicrograph showing mott cells with numerous inclusion bodies [Figure 2].

The inclusions of Mott cells represent immunoglobulins within vesicular structures. These inclusions are Russell bodies which are dilated endoplasmic reticulum cisternae containing condensed immunoglobulins (Ig). As to their biogenesis, it was shown that the synthesis of a mutated Ig, which is neither secreted nor degraded, is sufficient to induce Russell body formation in cells. Russell bodies were originally described in plasma cells, and their frequency in this cell type probably correlates with the fact that immunoglobulin genes undergo somatic hypermutation. However, dilated endoplasmic reticulum (ER) cisternae containing condensed aberrant proteins are found in secretory cells of different origins, suggesting condensation of transport-incompetent proteins in the ER as the common cause for this morphological feature. Many disease-linked cases of intraluminal protein accumulation have been described including thyrocytes of congenital goiter patients and hepatocytes of individuals carrying mutated α1 anti-trypsin alleles (PiZ).[2]

Mott cells are characterised by the expression of B220, CD5, CD43, CD11b (Cluster of differentiation). Mott cell formation has been linked to a genetic locus-microsatellite marker (D4Mit70 & D4 Mit 48). Mott-1, in close proximity to the locus lmh-1 is associated with hypergammaglobulinemia.[3]

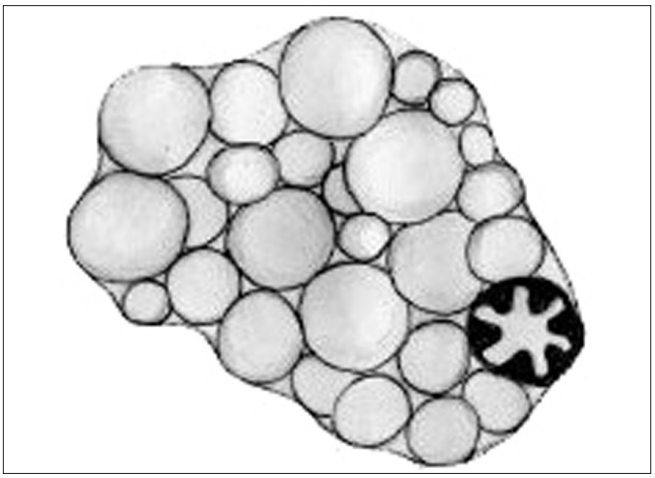

Figure 1: A Mott cell with multiple varied size spherical inclusions/ Russell bodies within a single plasma cell having an eccentrically placed clock face nucleus

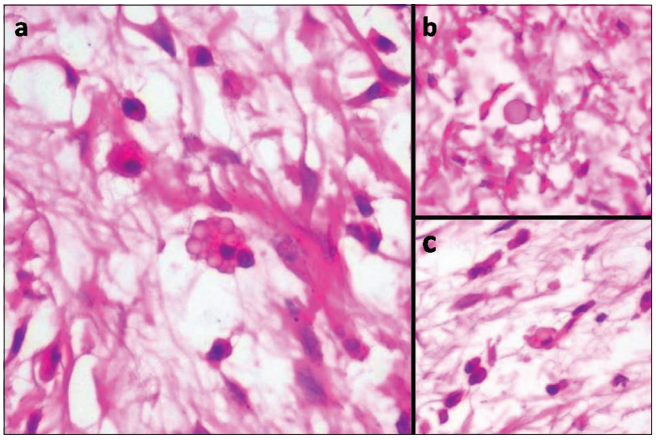

Figure 2: (a-c): Mott cells showing highly refractile inclusion bodies ranging from 3 to 15 in number (H and E, x400).

Various pathological conditions in which Mott cells can be sighted are: reactive plasmacytosis, various hematolymphoid malignancies viz., Burkitt's lymphoma, Large B-cell lymphoma, lymphoplasmablastic lymphoma, multiple myeloma, and syndromic conditions like Wiskott –Aldrich syndrome and von Recklinghausen's neurofibromatosis.[4]

Various special stains used to highlight Mott cells are Periodic Acid-Schiff (PAS) and May-Grünwald-Giemsa (MGG) stain.[1]

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Mott cell in the photomicrograph was encountered in a case of neurofibroma which was reported in our department.

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