

Multiparameter Flow Cytometry Immunophenotypic Diagnosis of Smoldering Multiple Myeloma: A Case Report

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Abstract

Smoldering multiple myeloma (SMM) is an asymptomatic clonal plasma cell (PC) disorder has a higher risk of progression to multiple myeloma (MM). SMM is defined by the presence of a serum monoclonal (M) protein of >3g/dL and/or 10% to 60% clonal bone marrow PCs (BMPCs) with no evidence of end-organ damage (i.e., CRAB criteria) or other MDE. Multiparametric flow cytometry Immunophenotyping (FCI) is useful in determining prognosis in SMM by accurately distinguishing and quantitating BMPCs that have malignant potential from normal PCs. Bone marrow specimen from a 68-year-old male was analyzed by 4-color flow cytometry, using cluster analysis of ungated data, for the expression of several markers including CD45, CD19, CD138, CD38, CD56, cytoplasmic kappa light chain and cytoplasmic lambda light chain. Other laboratory investigations were done to exclude hypercalcemia, renal insufficiency, anemia and bony lesion (CRAB) features. FCI analysis revealed a distinct population of cells of which more than 20% cells were expressing both CD138 (moderate) and CD38 (bright) that represent plasma cells. There was overexpression of CD56 with dim to moderate cytoplasmic kappa light-chain restriction and simultaneous downregulation of CD19 and CD45. Bence Jones protein in urine was absent, 70% BMPCs, no bony lesion in x-ray, hypocalcemia, anemia (9.2 g/dL) with rouleaux formation, monoclonal gammopathy with IgG band and Kappa band, free Kappa light chain with Kappa/Lambda ratio 19.00 (ref. range: 0.26-1.65) in serum free light chain assay. Immunophenotypic profile of BMPCs confirmed the case as SMM as this case has no CRAB features which differentiate it from MM. FCI has becoming an indispensable tool to diagnose SMM as early therapy can be potentially beneficial to patients.

Keywords: Smoldering multiple myeloma, Multiple myeloma, FCI, CD markers, Bone marrow plasma cells

Biography

Dr. Shirin Tarafder is Professor of Department of Microbiology and Immunology at Bangabandhu Sheikh Mujib Medical University in Bangladesh, a strong professional with a Master of Philosophy in Medical Microbiology; teaches Medical Immunology, Molecular biology, Mycology and Bacteriology for more than 32 years. Prof. Tarafder's expertise is on Clinical Immunology and Molecular biology. She introduced Flow cytometry immunophenotypic diagnosis of Leukemia, Lymphoma, Multiple myeloma, Primary immunodeficiency disorders (PID) and Paroxysmal nocturnal hemoglobinuria (PNH) in Bangladesh. She is working on cytogenetic studies in different diseases.

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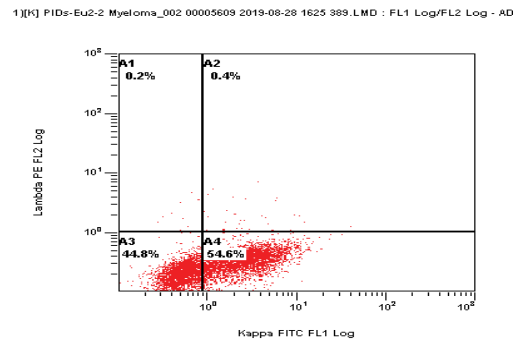
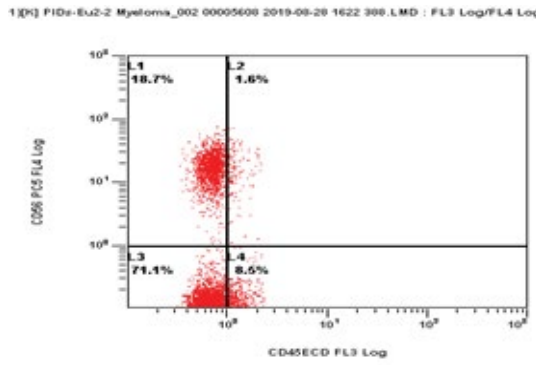
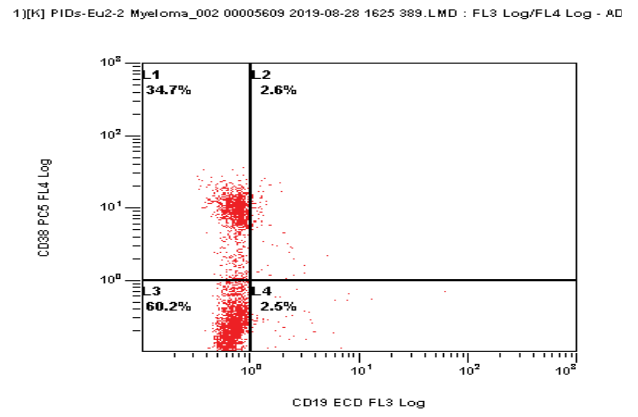
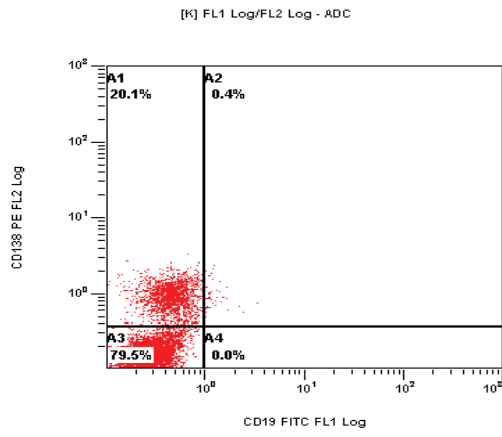
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