



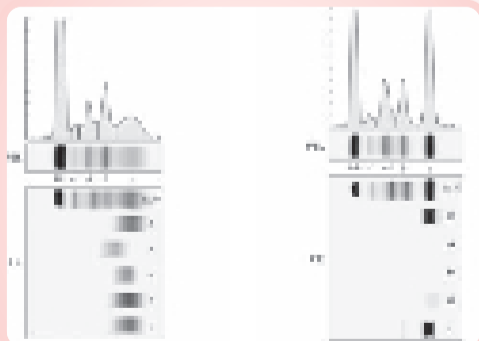
Gammopathy

Gammopathy refers to heterogeneous group of immunoglobulin disease characterized by the presence in serum or urine of a paraprotein (monoclonal gammopathy) or two distinct paraproteins (biclonal gammopathy)

Characteristic Features of Monoclonal Gammopathies

Disease	Monoclonal immunoglobulin spike (M-protein)	Other features
Multiple myeloma	Narrow M-Protein spike > 3 g/dL	<ul style="list-style-type: none"> Skeletal lesions present in 80 % patients > 10% plasma cells on bone marrow biopsy Anemia, pancytopenia, hypercalcemia, and renal disease may be present
Smoldering multiple myeloma	M-protein level > 3 g/dL	<ul style="list-style-type: none"> 10 % plasma cell involvement on bone marrow biopsy No lytic bone lesions, no anemia, no hypercalcemia, and no renal disease
Monoclonal Gammopathy of Undetermined Significance (MGUS)	M-protein level < 3 g/dL	<ul style="list-style-type: none"> < 10 % plasma cell involvement on bone marrow biopsy No M-protein in urine, no lytic bone lesions, no anemia, no hypercalcemia, and no renal disease
Waldenström Macroglobulinemia	IgM present	<ul style="list-style-type: none"> Hyperviscosity and hypercellular bone marrow with extensive infiltration by lymphoplasma cells
Plasma cell Leukemia	Low levels	<ul style="list-style-type: none"> Peripheral blood contains > 20 % plasma cells Few bone lesions and few hematologic disturbances Occurs in younger patients
Franklin Disease (Heavy chain disease)	-Heavy chain incomplete -Light chain absent	
Solitary plasmacytoma		<ul style="list-style-type: none"> No urine/ serum/ marrow abnormalities

Serum Electrophoresis Graph Photo with M Band



The M-spike (M-protein) demonstrates the clonal expansion of one type of plasma cell. The IFE and PEL results on the left are from a normal specimen. The results on the right are from an abnormal specimen, demonstrating an IgG lambda M-spike

Laboratory Tests in Diagnosis of Gammopathy

Protein electrophoresis

- Identifies presence of monoclonal immunoglobulin spike (an M-spike or M-protein)
- Differentiates between stable and increasing M-spikes
- Interprets an elevated Immunoglobulin class as polyclonal versus monoclonal
- Quantitates the elevated protein level
- Screens for diseases such as multiple myeloma, macroglobulinemia, or amyloidosis

Immunofixation

- Gold standard for detection and characterization of monoclonal proteins
- More sensitive than protein electrophoresis for detecting monoclonal immunoglobulins
- Identifies the heavy and/or light chain isotype

Serum free light chain analysis

- Allows quantitation of both κ and γ free light chains and calculates the free light chain κ : γ ratio
- Provides a risk assessment for progression of Monoclonal Gammopathies of Undetermined Significance (MGUS) to multiple myeloma
- Monitors the disease course in patients with a monoclonal protein that cannot be measured by protein electrophoresis
- Superior to immunofixation electrophoresis for detection of monoclonal light chain diseases

Serum free light chain quantitation, in conjunction with serum protein electrophoresis and immunoelectrophoresis, offers a higher sensitivity for diagnosis of monoclonal gammopathies

Metropolis Gammopathy Test Profile

Immunoglobulin profile

IgG, IgM, IgA

Immunofixation qualitative profile

Protein electrophoresis, Immunofixation

Immunofixation quantitative profile

Protein electrophoresis, Quantification of heavy and light chain, Immunofixation with characterization of M band

Sources:

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