

A Case of Biclonal Gammopathy

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1. Introduction

Plasma cell disorders are also known as monoclonal gammopathy / dysproteinemia / paraproteinemias. Multiple myeloma represents a malignant proliferation of plasma cells derived from single clone leads to number of organ dysfunction. Biclonal gammopathy is simultaneous appearance of two different m components. Biclonal gammopathy due to proliferation of two separate clones of plasma cells where each clone give rise to an unrelated monoclonal IG or single clone of plasma cells producing two different monoclonal proteins

2. Case Report

A 75 year old Mr. X known case of SHT/T2DM /CAD on regular treatment admitted with complaints of leg swelling for the past 2 weeks, low back ache, myalgia. on examination patient conscious, oriented, pallor +, bilateral pedal edema +. systemic examination; cvs-s1s2 +short systolic murmur +, respiratory system-B/L AE+ Crackles +, P/A SOFT BS+, CNS-NFND, BP-140/80mmhg, PR-96/min, SPO2-99% RA

3. Laboratory Investigations

HB	5.1gms	ALP	85
TC	7800	T.PROTEIN	8.4
DC	50/45/5	ALBUMIN	3.1
RBC	1.77	GLOBULIN	5.3
PCV	17	ESR 1/2 Hr	60/106
PLATELETS	1.4	S.CALCIUM	11.5
UREA	72mg	LDH	286
CREAT	2.5	URINE GLUCOSE	NIL
eGFR	31ml/mim /1.73m2	PROTEIN	TRACE
Na/K+	136/4.8	PUS CELL	1-2
T.BILIR	0.3	RBCS	0-1
D/ID	0.1/0.2	EPITH CELL	1-2
SGOT	34	PCR	32
SGPT	18		

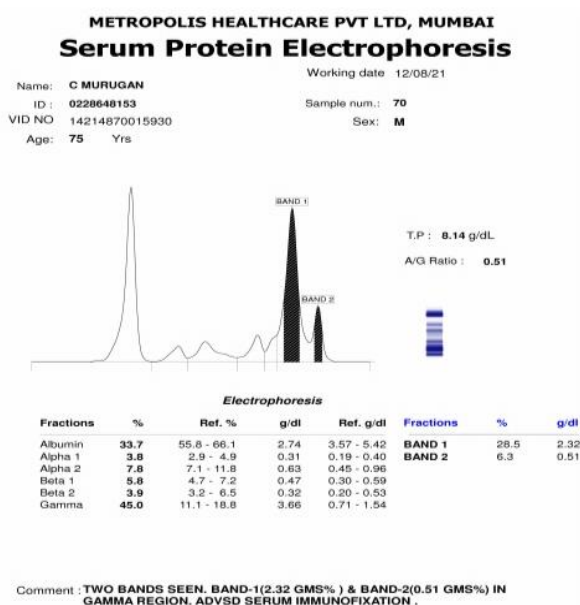
Immunofixation- Qualitative, Serum

Investigation	Observed Value
<i>Electrophoretic Zone</i>	
IgG	Absent
IgM	Absent
IgA	Present
Kappa	Present
Lambda	Absent
M-Band	See Comment
Impression	BICLONAL GAMMOPATHY SEEN IN IgA AND KAPPA REGION

Interpretation:

Bands in serum protein electrophoresis	Serum Immunofixation		Result
	Anti heavy chain antisera (IgG/ IgM/IgA)	Anti Light chain Kappa/Lambda	
Remark 1 1 band present	+	+	Presence of monoclonal
Remark 2 1 band present	-	+	1. Light chain disease, suggest urine Immunofixation 2. IgD or IgE disease 3. Multiple bands in lambda region indicates polymerised form
Remark 3 1 band present	+	-	Heavy chain disease.
Remark 4 Faint band present	Faint band	-	Cryoglobulin
Remark 5 2 band present	2 band with same or different anti-heavy chain sera	2 band with same different anti-light chain sera	1. Biclonal gammopathy 2. Paraprotein monomer/polymer of Immunoglobulins).

Associated Tests: Cytogenetic markers for Prognostication of Multiple Myeloma is available (Multiple Myeloma by FISH Panel - IGH gene rearrangement [t(11;14),t(4;14),t(14;16)] translocations, monosomy 13/deletion 13q14, deletion 11q, deletion 17p, chromosome 1p/q deletion/amplification ploidy status for chromosome 5,9 and 15) at Metropolis Healthcare.



SERUM, PROTEIN ELECTROPHORESIS

(Serum)

Investigation	Observed Value	Unit	Biological Reference Interval
Total Protein (Buret)	8.14	g/dL	6.4-8.3
Serum Albumin	2.74	g/dL	3.57-5.42
Alpha 1 Globulin	0.31	g/dL	0.19-0.40
Alpha 2 Globulin	0.63	g/dL	0.45-0.96
Beta 1 Globulin	0.47	g/dL	0.30-0.59
Beta 2 Globulin	0.32	g/dL	0.20-0.53
Gamma Globulin	3.66	g/dL	0.71-1.54
Albumin, Globulin Ratio	0.51		1.1-2.2
Comment	TWO BANDS SEEN. BAND-1(2.32 GMS%) & BAND-2(0.51 GMS%) IN GAMMA REGION. ADVSD SERUM IMMUNOFIXATION .		

Interpretation :

1. Serum protein electrophoresis is commonly used to identify multiple myeloma & related disorders.
2. Electrophoresis is a method of separating proteins based on their physical properties & the pattern is dependent on the fractions of 2 types of protein: Albumin & Globulin (alpha 1, alpha2, beta & gamma).

Components	Compositions	Interferences
Albumin	Albumin	Lipoproteins, Drugs, Bilirubin, Radiological contrast
Alpha1 - globulins	α-1 antitrypsin, α-1 acid glycoprotein	-
Alpha2 - globulins	α-2 macroglobulin, haptoglobin	Haptoglobin - haemoglobin complex
Beta globulins	Transferrin, β-lipoprotein, IgA, IgM & sometimes IgG with complement protein	Fibrinogen
Gamma globulins	IgG, IgA, IgM, IgD, IgE	CRP

Direct detection at 200 nm in capillaries yields relative concentrations (percentages) of individual protein zones.

Remarks :

1. The following conditions require serum immunofixation to differentiate monoclonal and polyclonal disorders.
(A) A well defined 'M' band (B) Faint band.
(C) Chronic inflammatory pattern (decreased Albumin, increased Alpha, increased Gamma region), which may mask the monoclonal band.
(D) Isolated increase in any region, with otherwise normal pattern.

2. Shouldering of albumin peak along anodal or cathodal side may be seen with lipoproteins, drugs, bilirubin or radiological contrast.

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Serum Protein Electrophoresis

Clinical Course:

Patient was diagnosed as a case of biclonal gammopathy. He was treated with chemotherapy Inj Bortezomib and steroids. Patient gotimproned with cycles of chemotherapy and discharged patient is under followup now.

4. Discussion

Biclonal Gammopathy

Simultaneous appearance of two different m components, the incidence is 1% of all myeloma2 bands with same or different anti heavy chain sera.2 bands with same /different anti light chain sera

According to different literature, biclonal gammopathy due to proliferation of two separate clones of plasma cells where EAC clone gives rise to an unrelated monoclonal immunoglobulin single clone of plasma cells producing two different monoclonal proteins

5. Conclusion

Biclonal gammopathy patient is more symptomatic than monoclonal gammopathy there is no significant difference in respect to clinical features and presentation and response to therapy

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