A Case of Multiple Myeloma

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ABSTRACT: We describe a case of 60 year male with Multiple myeloma. His serum was found very viscous. Its total protein was found 10.5 gm% and serum protein electrophoresis showed M band. X-ray of the skull showed multiple lytic lesions.

Key words: Multiple myeloma, M band

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INTRODUCTION: A 60 year old male patient was presented with history of backache for 3 year. Initially he had only pain in cervical spine, than pain extended subsequently to lumbar spine, hip joint, knee joint, intercostal joint and finally to all the bones and joints. Bony Pain, around chest and upper back, was also there with normal respiration and exaggerated during coughing. For 3 months, he was not able walk and for last 2 months, he could not even sit on chair. He had significant weight loss in last 1 year, more than 10 kg.

He did not have any history of pathological fracture or fever in this course of disease. His X-ray skull shows multiple lytic lesions. X-ray of other long bone shows less bone density and lytic lesion.

MATERIAL AND METHODS: After collecting the sample in plain vacutte, we centrifuged the sample. Immediately after centrifugation we found that serum was separated but serum was highly viscous. We kept the sample at 37'c in incubator for 30 min. After that serum liquefied. To prevent repeat error of analyzer probe block, serum was diluted in 1:3 ratio for analyzing biochemistry parameter in fully automated Erba XL-640.From undiluted sample protein electrophoresis through agarose gel electrophoresis , using Hippurate buffer (Ph 8.8) was done.

RESULTS: Albumin=3.6 gm% and Total Protein=10.5 gm% was reported. Serum protein electrophoresis shows M band at gamma globulin position.We report a multiple myeloma case through presence of M band in serum electrophoresis from undiluted sample. Urine electrophoresis does not show M band.

Biochemistry examination results from serum and urine sample are as following:

Test parameter	Result	Reference range
S. Albumin	3.2 gm%	3.5-5.0 gm%
S. Globulin	6.9 gm%	2.3-3.5 gm%
S. Total protein	10.5 gm%	6.5-8.5 gm%
S. A/G ration	0.46	1.2-1.5
S. Calcium	7.2 mg%	8.5-11 gm%
S.Alkaline phosphatise	90 IU/ml	42-128 U/L
S. Creatinine	0.6 mg%	0.6-1.6 mg%
S.Alanine transaminase	15 IU/ml	<45 U/L
Urine Total protein	18 mg/dl	N/A
24 hr urinary protein	270 mg/day	<150 mg/day

Bone marrow biopsy shows presence of 45% plasma cells.

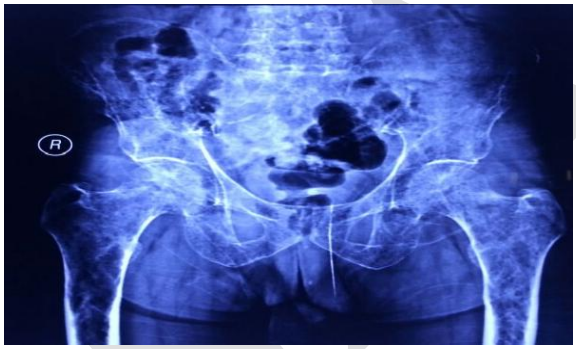


Fig 1 Lytic lesion in Hip bone and femur

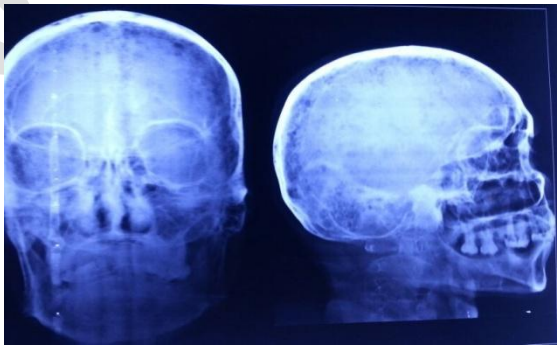
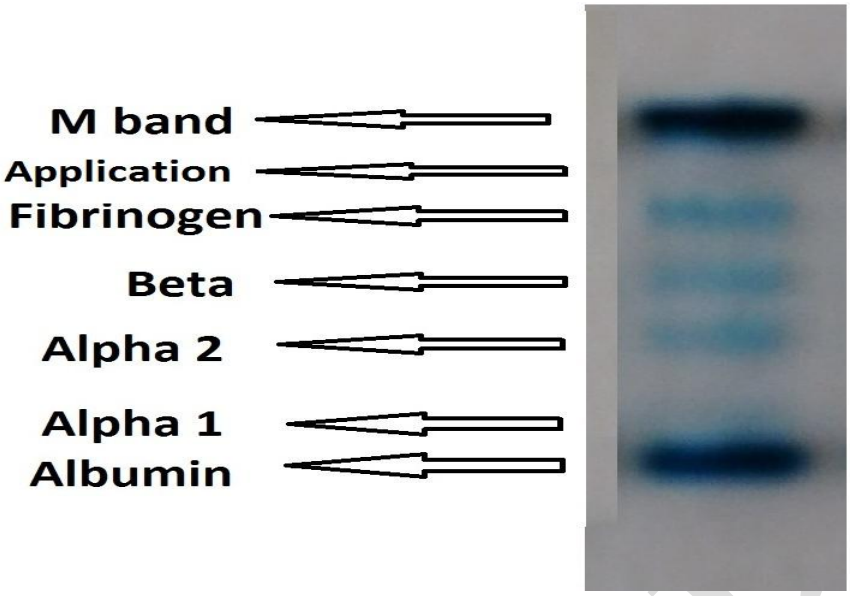


Fig 2 Lytic lesion in skull

DISCUSSION: Multiple myeloma (MM) is the third most common form of haematological malignancy after non-Hodgkin's lymphoma and leukaemia.1 it is a plasma cell malignancy characterised by an abnormally serum and /or urine has immunoglobulin intact paraprotein or free immunoglobulin light chain as a result of clonal expansion of plasma cells. It is often accompanied by complications of enhanced bone loss associated with diffuse osteopenia or focal lytic lesions, renal failure, hypercalcaemia, immune suppression and anaemia.4

Fig 3 Serum protein electrophoresis of patient with multiple myeloma



Multiple Myeloma Diagnosis

Diagnosis should be based on following tests

- Detection and evaluation of the monoclonal (M-) component by serum and urine protein electrophoresis (concentrate of 24-h urine)[3]
- Evaluation of bone marrow plasma cell infiltration[3]
- Evaluation of lytic bone lesions[3]
- Serum calcium level.[4]
- Renal insufficiency.[4]
- serum Creatinine[4]
- Anaemia [4]
- Bone lesions(lytic lesions)[3]
- Symptomatic hyperviscosity, amyloidosis, recurrent bacterial infections (>2 episodes in 12 months).[4]

Diagnostic criteria according to the International Myeloma Working Group 2003[4][4]

1. MONOCLONAL GAMMOPATHY OF UNDETERMINED SIGNIFICANCE (MGUS)

Serum para-protein <30g/l

Bone marrow clonal plasma cells <10% in the aspirate, and low level of plasma cell infiltration in the trephine.

No myeloma–related organ or tissue impairment or symptoms.

2. ASYMPTOMATIC MYELOMA

Serum paraprotein ≥30g/l and/or bone marrow clonal plasma cells≥10%.

No myeloma-related organ or tissue impairment or symptoms.

No evidence of other B-cell lymphoproliferative disease (LPD) or light chain associated amyloidosis or other light chain, heavy chain or immunoglobulin associated tissue damage.

3. SYMPTOMATIC MYELOMA

PARAPROTEIN in serum and/or urine.

Bone marrow clonal plasma cells or biopsy proven plasmacytoma.

Any myeloma-related organ or tissue impairment.

Hypergammaglobulinemia increases serum viscosity and is the most common cause of hyperviscosity syndrome[2].In myeloma patients, hyperviscosity (increased serum viscosity) results from increased levels of circulating serum immunoglobulins. Proteins do not dissolve in a solution. The more protein in a liquid, the more likely it is that the liquid will be viscous. Hyperviscosity is most likely due to excess IgM and least likely due to excess IgG, IgE, or IgD.[2]

CONCLUSION: Following findings in the case helped diagnosis of multiple myeloma:

- Multiple bone and joint pains
- bone marrow biopsy which shows 45% of plasma
- Presence of M band in serum protein electrophoresis ,
- Viscous serum
- reversal of albumin:globulin ratio
- Mild Anaemia(Hb=9.3 gm/dl)
- Lytic lesion in x-ray of skull and all long bones
- The viscus serum of multiple myeloma patient can block analyser probe and give error during analytic run.

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