A Patient of Multiple Myeloma with Absent M (BAND)!!

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Abstract

Multiple myeloma constitutes a malignant proliferation of plasma cells acquired from a single clone. The tumor and its products and response of host to it causes number of organ dysfunctions. symptoms of which includes bone pain or fracture, renal dysfunction , vulnerability to infection, neurological symptoms , anemia, hypercalcemia, and clotting abnormalities, and manifestations of hyper viscosity. The median age of diagnosis in Indian population is 54 years . Males more commonly affected than females. In India, incidence of MM is 1.2 to 1.8 per 100,000 in males . We present a rare presentation of multiple myeloma with elevated serum free light chain and normal serum protein electrophoresis in contrast to more common presentation of abnormal serum protein electrophoresis. Multiple myeloma should not be excluded only on the basis of the absence of monoclonal gammopathy on protein electrophoresis . So, all the sub types of multiple myeloma need to be thoroughly studied to reach an accurate diagnosis.

Keywords: multiple myeloma, bone pain, pathologic bone fractures ,serum protein electrophoresis, free light chains, immunofixation, plasma cells

Introduction

Multiple myeloma is a disease with a malignant proliferation of plasma cells which are derived from a single clone of plasma cell . Patients are usually diagnosed at a median age of 66-77 years with 37% of those with age less than 65. Secretion of abnormally large quantities of immunoglobulin from the plasma cells are responsible for development of M band on serum protein electrophoresis . Accumulation and proliferation of this abnormal protein in bone causes enlargement and thinning of bones and in turn causes bone pain and pathological fracture. Other effects of this accumulation of this abnormal immunoglobulins causes structural and functional effects on various organ of the body like renal failure, susceptibility to infection, anemia, hypercalcemia, and occasionally clotting abnormalities, neurologic symptoms, and manifestations of hyperviscosity . Complete blood count (CBC), blood biochemistry , beta-2 microglobulin tests, immunoglobulin studies, skeletal survey, and bone marrow biopsy are the various diagnostic investigations required . The treatment includes chemotherapy and bone marrow stem cell transplant consideration. We present a case of symptomatic patient with normal serum protein electrophoresis (SPEP) but elevated serum-free light chains

during serum immunofixation a rare presentation of multiple myeloma. [3]

Case presentation

A 55 year old male patient presented to SVP hospital with chief complaint of weight loss of 10-15 kg associated with generalized weakness , decreased appetite and dyspnea on exertion , cough with occasional blood stained sputum since last two and half months and right sided shoulder pain since 15 days claimed to be occurred after intramuscular injection at the site. Patient was having no comorbidities and was in a good health otherwise. On physical examination patient was having evidence of severe pallor and inability to move right upper limb due to severe pain with no associated lymphnode enlargement. vitals were stable on admission to the department. Basic laboratory investigations were sent and the results are summarized in the table below.

Table -1 Basic laboratory investigations

TEST	RESULT	REFERENCE VALUE
Hemoglobin	5.4 g/dl	12-18
RBC count	1.68	4.5-5.5
Hematocrit	18.7%	40-50
MCV	111.3 fl	83-101
Total WBC counts	20.71Ku/l	5.2-12.4
Platelets	192 Ku/l	130-400
ESR	32	0-15
Serum creatinine	6.82 mg/dl	0.7-1.3
Blood urea	148.7 mg/dl	15-45
Sodium	138 mmol/L	132-146
Potassium	7.6 mmol/L	3.5-5.5

Patient was having macrocytic normochromic peripheral blood smear .Patient was not having any complaint of pedal edema or decreased urine output. In view of low HB and elevated creatinine and blood urea renal and anemia workup done. The results of the same are as below

Table-2 Renal & Anemia Workup

TEST	Result	Reference value
Serum iron	241	65-175
Serum ferritin	884	10-282
Serum vitamin b12 levels	1885	211-911
Serum calcium	13.1 mg/dl	8.6-10
Serum ionized calcium	1.85 mmol/L	1.12-1.32
Serum phosphorus	6.23 mg/dl	2.3-4.6
Serum uric acid	12.38 md/dl	3.7-9.2
Serum PTH	6.23 mg/dl	2.5-4.6

Usg abdomen was normal with no altered kidney size and increased cortical echogenicity with preserved corticomedullary differentiation. In view of very high calcium levels associated with altered renal function test some malignancy was suspected and relatives were counseled for the same . HRCT thorax was done in view of weight loss and hemoptysis with hypercalcemia to rule out lung malignancy which came to be negative. Shoulder x-ray was done in view of pain on movement which was suggestive of lytic lesions in proximal shaft of humerus with cortical thinning. Further xray of skull done which was suggestive of multiple lytic lesions with punched out margins. In view of above findings multiple myeloma was suspected and further workup advised.

Fig .1. Lytic lesion in proximal humerus

Fig.2. Pathological fracture of humerus

Fig.3.Lytic lesions on skull

Serum protein electrophoresis done which was suggestive of no monoclonal gammopathy. Serum urine electrophoresis was also suggestive of no monoclonal gammopathy. Serum total protein albumin ratio was 2 (N-1.5-2.5).

For further workup serum immunoelectrophoresis and serum free light chain assay was done along with bone marrow aspiration and biopsy . Reports are as below

Table- 3 Immuno-electrophoresis

Test	Results	Reference value
Ig A	2.46 gm/L	0.7-4.0
Ig G	5.40 gm/L	5.49-5.84
Ig M	<0.166 gm/L	0.4-2.3
Kappa Light chain	5.03 gm/L	1.38-3.75
Lambda light chain	0.59 gm/L	0.93-2.42

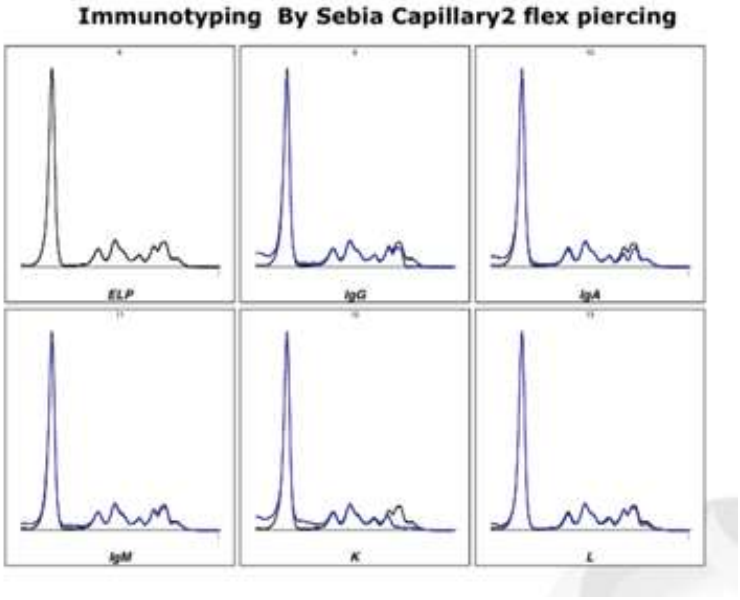

Fig .4. Immuno-electrophoresis report suggestive of monoclonal band with only Kappa chain restriction

Free Kappa Lambda chain ratio
Free Kappa chain - 14700 mg/L (N-6.7-22.4)
Free Lambda chain – 25 mg/L (N-8.3-27)
Free Kappa chain Lambda chain ratio – 588 (N- 0.31-1.56)

Bone marrow aspiration was suggestive of 60% of all nucleated cells are mature and immature plasma cells which was confirmed with bone marrow biopsy. Thus diagnosis of multiple myeloma with Kappa light chain was confirmed.

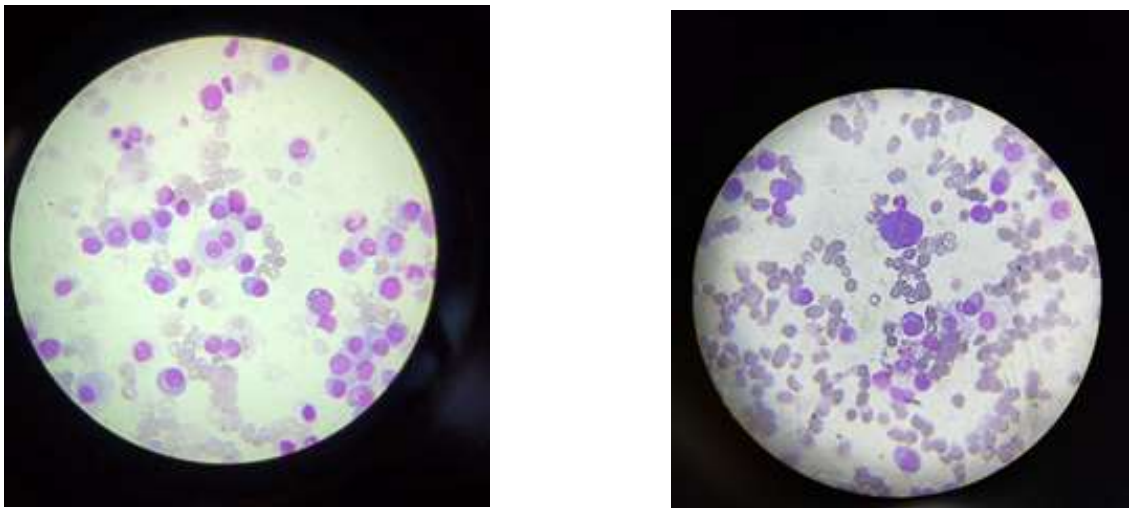

Fig.5. Plasma cells in bone marrow aspiration smear

Patient was managed with hemodialysis with 2 units of PCV transfusion in view of persistent hyperkalemia and severe anemia. Patient developed pathological fracture of right humerus (Fig.2.) and conservative management of the same done. Whole body PETscan was not done due to financial constrains. Patient was started with induction chemotherapy with dexamethasone 40mg per day for 4 days repeated every week and boretzomib and cyclophosphamide along with prophylaxis for further prevention of bone resorption and opportunistic infection. Patient was referred to specialized oncology center for further management.

Discussion

Multiple myeloma is disease of abnormal proliferation of plasma cell in bone marrow and it constitutes 10% of the hematological malignancies[4]. The main feature of multiple myeloma is secretion of monoclonal proteins in serum and urine . This M proteins are seen in only 82% of the patients and detected by serum protein electrophoresis. The diagnosis of multiple myeloma is further confirmed by other radiological and histological and biochemical tests. Non-Secreting Myeloma (NSM) is one of the type of multiple myeloma that is uncommon which is characterized by absence of secretion of monoclonal proteins in serum and urine . The first test for the suspected case of multiple myeloma is serum protein electrophoresis . if this test is negative than it can lead to false diagnosis of NSM type of MM . Hence , all the subtypes of multiple myeloma should be extensively studied to reach an accurate diagnosis. Further workup with immunoelectrophoresis and free light chain assay is useful for confirmation of diagnosis of multiple myeloma in whom initial screening test is negative. [5]

Conclusion

In conclusion, a patient presenting with unexplained acute kidney injury , unexplained severe anemia or severely increased blood calcium levels[6] should undergo further workup for diagnosis of multiple myeloma. CBC, Serum biochemistry, Protein electrophoresis, Immunofixation, Free light chain studies, Radiologic imaging, Bone marrow aspiration and Bone marrow biopsy are done to conclude diagnosis of multiple myeloma with respect to their subtypes. Ruling out multiple myeloma only on the basis of The absent M spike on serum protein electrophoresis or normal immunofixation should not be done. [7]

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