



## Multiple Myeloma presenting as Hypercalcemic Crisis: A case report

Akhilesh Annadatha<sup>1</sup>, Sourya Acharya<sup>2</sup>, Samarth Shukla<sup>3</sup>, Amol Bhawane<sup>4</sup>, Anuj Varma<sup>5</sup>, Amol Andhale<sup>1</sup>✉

<sup>1</sup>Resident, Department of Medicine, Jawaharlal Nehru Medical College, DattaMeghe Institute of Medical Sciences (Deemed to be University), Sawangi (Meghe), Wardha-442001, Maharashtra, India

<sup>2</sup>Professor, Department of Medicine, Jawaharlal Nehru Medical College, DattaMeghe Institute of Medical Sciences (Deemed to be University), Sawangi (Meghe), Wardha-442001, Maharashtra, India

<sup>3</sup>Professor, Department of Pathology, Jawaharlal Nehru Medical College, DattaMeghe Institute of Medical Sciences (Deemed to be University), Sawangi (Meghe), Wardha-442001, Maharashtra, India

<sup>4</sup>Asst. Prof, Department of Medicine, Jawaharlal Nehru Medical College, DattaMeghe Institute of Medical Sciences (Deemed to be University), Sawangi (Meghe), Wardha-442001, Maharashtra, India

<sup>5</sup>Asso. Prof, Department of, Jawaharlal Nehru Medical College, DattaMeghe Institute of Medical Sciences (Deemed to be University), Sawangi (Meghe), Wardha-442001, Maharashtra, India

### ✉Corresponding author

Resident, Department of Medicine, Jawaharlal Nehru Medical College, DattaMeghe Institute of Medical Sciences (Deemed to be University), Sawangi (Meghe), Wardha-442001, Maharashtra, India

Email: dramoljnm@gmail.com

### Article History

Received: 29 June 2020

Reviewed: 30/June/2020 to 01/August/2020

Accepted: 02 August 2020

E-publication: 11 August 2020

P-Publication: September - October 2020

### Citation

Akhilesh Annadatha, Sourya Acharya, Samarth Shukla, Amol Bhawane, Anuj Varma, Amol Andhale. Multiple Myeloma presenting as Hypercalcemic Crisis: A case report. *Medical Science*, 2020, 24(105), 3148-3152

### Publication License



This work is licensed under a Creative Commons Attribution 4.0 International License.

### General Note



Article is recommended to print as color digital version in recycled paper.

## ABSTRACT

Multiple myeloma, a disease of the plasma cells, clinically presents as lytic bone lesions, hypercalcemia, renal failure, and secretion of either complete immunoglobulins (light and heavy chain) or incomplete immunoglobulins (light chain). The light chain secretion into urine is called as Bence Jones protein which is another characteristic of the disease. Hypercalcemic crisis is an acute condition which presents with Oliguria or Anuria and sometimes, Coma. The cause of hypercalcemic crisis is usually Primary Hyperparathyroidism. Hypercalcemia of malignancy is one of the rarer causes of the same. We present a case of Multiple Myeloma presenting as hypercalcemic crisis.

**Keywords:** Crisis, hyperparathyroidism, bence-jones, light chain, heavy chain

## 1. INTRODUCTION

Multiple myeloma is a disease classified under monoclonal gammopathies. It is characterized by clonal proliferation of a single type of immunoglobulin in bone marrow. This assists in causing end organ damage, and other associated complications (Lonial & Miguel, 2013). Myeloma sometimes may have a premalignant stage in which no end organ damage is seen, but has monoclonal plasma cells. This stage is known as Monoclonal Gammopathy of Unknown Significance (MGUS) or Smouldering Myeloma (Dimopoulos et al., 2011). The clonal plasma cells secrete immunoglobulins that can be detected by Urine protein electrophoresis or serum protein electrophoresis or if only light chains are secreted, then serum free light chain assay. Hypercalcemic crisis usually caused by Hyperparathyroidism and rarely with other causes (Binstock & Mundy, 1980). Hypercalcemic crisis is usually defined as a condition involving the decompensation of Hypercalcemia which is either acute or chronic. Hypercalcemic crisis secondary to Multiple Myeloma is rare (Guo et al., 2017).

## 2. CASE REPORT

A 57 year old male presented with the complaints of severe shoulder and hip pain since 1 month, generalised weakness since 15 days, nausea since 15 days, vomiting 8-10 episodes per day since 10 days, decreased urine output since 10 days. He had no history of fever, abdominal pain, chest pain cough, hematemesis, and malena. On examination, his blood pressure was 100/70 mm hg, right arm supine position, pulse was 78 beats/min, CVS- normal heart sounds heard, RS - Chest clear, Per-Abdomen was soft and CNS examination revealed no neurological deficit.

Routine investigations revealed Hb - 5 gm%, WBC - 7900 / cu.mm, Platelet count was 1.8 lakhs/cu.mm, Urea - 79 mg/dl, creatinine - 8.0 mg/dl, Sodium - 147 mEq/lit, Potassium - 4.1 mEq/lit. Serum calcium was 14 mg/dl, Total protein was 7.8 g/dl, serum albumin-3.8 g/dl. Albumin corrected serum calcium was 14.16 g/dl. Serum phosphorus was 5 mg/dl. Urine examination revealed Urine Albumin +, with no Urine sugar and 1-2 pus cells/hpf. ESR -122 mm in 1<sup>st</sup> hour. In view of anemia, bone pains, hypercalcemia, renal failure and raised ESR, a provisional diagnosis of multiple myeloma with hypercalcemic crisis was made. Urine for Bence Jones protein was positive and Serum protein electrophoresis revealed M spike. (Figure 1) X ray of the skull showed multiple punched out lesions (Figure 2). Patient was then planned for Bone Marrow Aspiration (Figure 3) which revealed 37% plasmablasts, 12% plasmacytes and 6% lymphocytes. Other myeloid series cells were at 45% suggesting Multiple Myeloma.

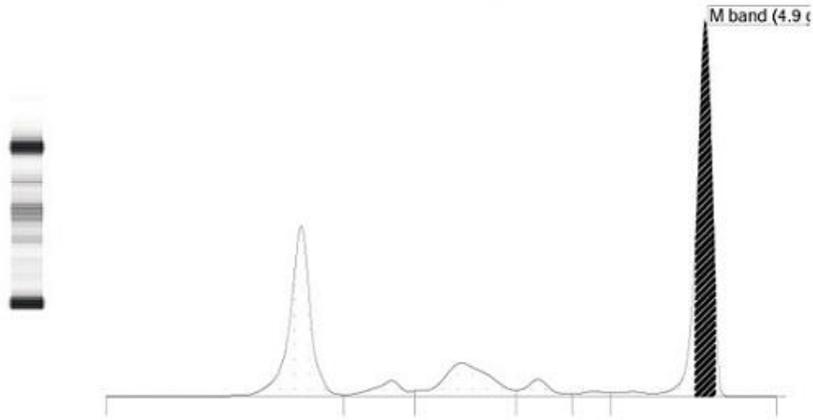
The patient was treated with hydration with iv isotonic saline, iv dexamethasone 4 mg 6 hourly, iv zoledronic acid 4 mg once Hemodialysis using a calcium-free dialyste to remove the excess calcium and alleviate uremic symptoms. With the therapy serum calcium levels were normalized and patient was then referred to the hemato-oncology division for the treatment of the Multiple Myeloma.

## 3. DISCUSSION

Hypercalcemia happens to be the commonest metabolic complication of myeloma, and excessive osteolysis is the culprit in causing the same (Tuttle et al., 1991). The clinical symptomatology depends on the ionized calcium levels in the body; and hypercalcemic crisis, requires urgent medical attention to avoid fatality. Patients have severe hypercalcemia of at least more than or equal to 14 mg/dl along with quick central nervous system, cardiac, gastrointestinal, and renal function deterioration (Lew et al., 2006). Hypercalcemic crisis has a myriad of symptoms like anorexia, vomiting, dehydration, altered renal functions, deterioration of mental status, confusion, coma, and if not treated, death. In hypercalcemia secondary to myeloma, impaired renal function is always present and serum phosphate is usually elevated and is seen with reduced glomerular filtration rate. Bone formation markers i.e serum alkaline phosphatases are not commonly elevated in myeloma patients (Durie et al., 1981).

BARCODE : J4330044

Serum protein electrophoresis



Fractions	%	Ref. %	Conc.	Ref. Conc.
Albumin	29.5 <	55.8 - 66.1	3.5	3.6 - 5.4
Alpha 1	3.9	2.9 - 4.9	0.5	0.2 - 0.4
Alpha 2	13.0 >	7.1 - 11.8	1.6	0.5 - 1.0
Beta 1	3.4 <	4.7 - 7.2	0.4	0.3 - 0.6
Beta 2	1.1 <	3.2 - 6.5	0.1	0.2 - 0.5
Gamma	49.1 >	11.1 - 18.8	5.9	0.7 - 1.5

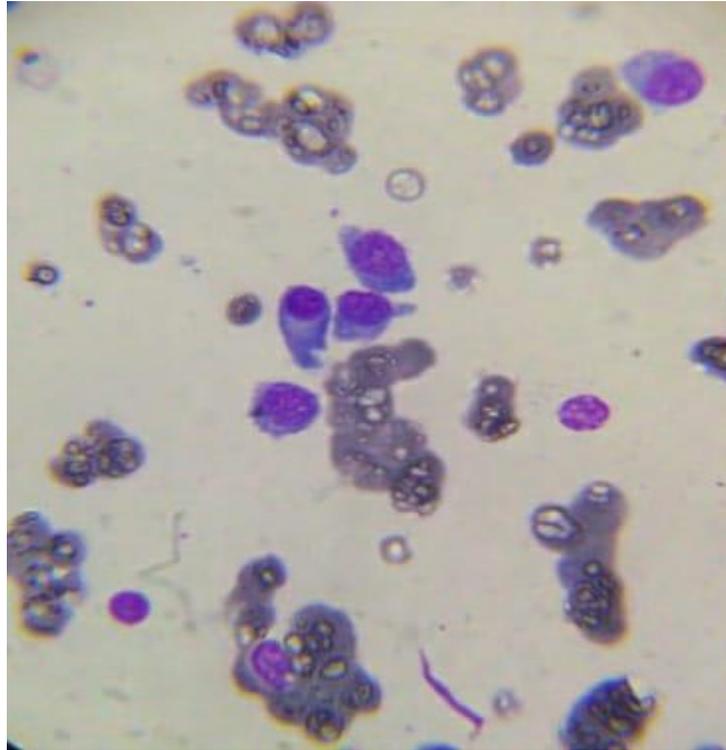
A/G Ratio: 0.42                      Total Protein : 12      g/dL

COMMENTS : M band detected in gamma region. (M band = 4.9 g/dl; SMC = 41.0%).  
 Advised: Immunofixation study for confirmation.

Figure 1 Serum Protein Electrophoresis showing M-Spike



Figure 2 X ray Skull lateral view showing Multiple, Punched out lytic lesions



**Figure 3** Bone Marrow Aspiration showing Plasma cells characteristic of Multiple Myeloma

The kidneys are the organs of regulation of calcium homeostasis and they act by increasing or decreasing the secretion of calcium in urine. Abrupt stoppage of calciuria secondary to renal insufficiency (in this case due to Multiple myeloma), the stored calcium may induce hypercalcemic phase until the other counter regulatory mechanisms set in. A failure of the counter regulatory mechanisms will lead to accumulation of calcium in the body and may result in the hypercalcemic crisis. Renal insufficiency secondary to untreated hypercalcemia is an emergency and can be lethal. It can be treated by bisphosphonates, hydration, and hemodialysis against a dialysate devoid of calcium (Ziegler, 2001).

#### 4. CONCLUSION

At the time of diagnosis, hypercalcemia is usually an associated feature of Multiple myeloma. Clinical features may range from symptoms anorexia, nausea, vomiting, polyuria, polydipsia, increased constipation, weakness, confusion, or stupor. Hypercalcemia can also contribute to the development of renal insufficiency. Severe hypercalcemia can be lethal. Treatment is with hydration, corticosteroids, bisphosphonates and if required hemodialysis along with chemotherapy for multiple myeloma per se.

#### Acknowledgement

We thank the patients who participated in and contributed samples to the study.

#### Conflict of Interest

The authors declare that there are no conflicts of interests.

#### Funding

This study has not received any external funding.

#### Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study.

#### Data and materials availability

All data associated with this study are present in the paper and/or the Supplementary Materials.

**Peer-review**

External peer-review was done through double-blind method.

**REFERENCES AND NOTES**

1. Binstock ML, Mundy GR: Effect of calcitonin and glucocorticoids in combination on the hypercalcemia of malignancy. *Ann Intern Med* 93: 1980; 269-272
2. Dimopoulos M, Kyle R, Fermand JP, et al. Consensus recommendations for standard investigative workup: report of the International Myeloma Workshop Consensus Panel 3. *Blood*. 2011;117:4701-5
3. Durie BGM, Salmon SE, Mundy GR. Relation of osteoclast activating factor production to the extent of bone disease in multiple myeloma. *Br J Haematol*. 1981;47:21–30.
4. Guo, Y., He, L., Liu, Y., & Cao, X. A rare case report of multiple myeloma presenting with paralytic ileus and type II respiratory failure due to hypercalcemic crisis. *Medicine*, 96(52); 2017; e9215
5. Lew JI, Solorzano CC, Irvin GL 3<sup>rd</sup>. Long-term results of parathyroidectomy for hypercalcemic crisis. *Arch Surg* 2006;141:696-9.
6. Lonial S, Miguel JF. Induction therapy for newly diagnosed multiple myeloma. *J Natl Compr Canc Netw*. 2013;11:19-28
7. Tuttle KR, Kunau RT, Loveridge N, Mundy GR. Altered renal calcium handling in hypercalcemia of malignancy. *J Am Soc Nephrol*. 1991;2:191–199
8. Ziegler R: Hypercalcemic crisis. 2001; *JASN*, 12, S3-S9