Multiple Myeloma Presenting as Spinal Cord Compression: A Report of Five Cases

Mondita Borgohain[1], Pranjal Kumar Gogoi[2], Sujay Karmakar[3], Pradeep K[4]

ABSTRACT

Introduction: Multiple Myeloma is a hematologic malignancy of plasma cells resulting in lytic bone lesions, M-protein in serum and renal insufficiency. Multiple Myeloma accounts for 1% of all malignancies and 10-20% of all haematological malignancies. Patients of Multiple Myeloma mostly present with pain, tenderness and pathological fractures. Multiple Myeloma causing skeleton related events are not uncommon. Among them, spine is one of the most commonly involved. Myeloma lesions may extends through the cortex of a vertebral body resulting in spinal cord compression.

Case report: Here we are reporting FIVE cases, who presented initially with spinal cord compression. The patients were subjected to MRI scan and biopsy of the collapsed vertebrae was taken. The histopathological and the hematological reports confirmed a diagnosis of Multiple Myeloma.

Conclusion: Spinal cord compression is an uncommon complication of Multiple Myeloma. A diagnosis of Multiple Myeloma should be thought of in cases of spinal cord compression. Usually this complication is associated with far advanced malignancy and a poor prognosis.

Keywords: Multiple Myeloma, Plasma Cell, Spinal Cord Compression

INTRODUCTION

Multiple myeloma is a neoplastic proliferation of monoclonal plasma cell characterized by anemia, kidney failure, osteolytic bone lesions, hypercalcemia, and renal failure.[1,2] Age-adjusted incidence of multiple myeloma is approximately four per 100,000. It represent the second most common hematological malignancy after non-Hodgkin lymphomas and consists of 10% of all hematologic malignancies.[3] The median age at diagnosis is approximately 65 years, and the disease is more common in black people compared with white people.[4] Multiple myeloma is actually a group of several separate cytogenetically distinct plasma cell neoplasms, it consists of a spectrum from localised, smoldering or indolent to aggressive metastatic forms. The diagnosis of multiple myeloma is not done by histopathology alone but a combination of radiological, pathological and clinical laboratory findings are needed.

Bone disease is the chief cause of morbidity and may be diagnosed by X-ray, MRI (magnetic resonance imaging), or FDG PET/CT (fluoro-deoxyglucose positron emission tomography/computed tomographic) scans. Vertebral lesions can result in pain, permanent deformity, kyphosis, walking impairment, permanent disability, or paralysis. Spinal cord compression due to narrowing of the spinal canal with collapse of vertebral bodies and tumour extension into the adjoining epidural space is an uncommon complication of the disease.[5]

CASE REPORTS

Here we are reporting five cases, who presented initially with spinal cord compression. The patients were subjected to MRI scan and biopsy of the collapsed vertebrae was taken. The radiological, histopathological and the hematological reports confirmed a diagnosis of Multiple Myeloma.

Case 1: A 36 year old female presented with upper back pain, lower extremity weakness and urinary incontinence. On examination she had absence of B/L lower extremity reflexes and decreased superficial and deep sensations. M-band was found on electrophoresis and abnormal immunoglobulin was found to be of IgA subtype by immunofixation electrophoresis. Blood examination revealed anemia (Hb- 8.8%). Bone marrow biopsy showed 15% plasma cells. MRI demonstrated spinal cord compression at C7-T2 level (Figure 1).

Case 2: A 59 year old male presented with progressive lower extremity weakness, urinary incontinence and lower extremity tingling and numbness. On neurological examination he had absence of B/L lower extremity reflexes and decreased superficial and deep sensations. Serum electrophoresis demonstrated an M-band and abnormal immunoglobulin was found to be of IgG subtype by immunofixation electrophoresis. Blood examination revealed anemia (Hb- 9.5%) but no renal insufficiency or hypercalcemia was found. Bone marrow biopsy showed 20% plasma cells. MRI demonstrated spinal cord compression at T1 level (Figure 2)

Case 3: A 47 year old male presented with upper back pain and progressive weakness of left upper limb. On neurological examination he had loss of deep and superficial reflexes at and below the lower abdomen. Serum electrophoresis demonstrated an M-band and abnormal immunoglobulin was found to be of IgG subtype. Bone marrow biopsy showed 20% plasma cells. MRI demonstrated spinal cord compression at T9 level.

Case 4: A 56 year old male with chief complain of progressive lower extremity weakness was detected with decreased sensation in B/L lower limbs and reduced power of both the lower limbs on neurological examination. Serum electrophoresis demonstrated an M-band and abnormal immunoglobulin was found to be of IgG subtype. Bone marrow biopsy showed 25% plasma cells.

[1]Professor, [2]Demonstrator, [3]Postgraduate, Department of Pathology, [4]Postgraduate, Department of Radiodiagnosis, Assam Medical College And Hospital, Dibrugarh, Assam, India

Corresponding author: Dr. Pranjal kumar Gogoi, Department of Pathology, Assam Medical College and Hospital, Dibrugarh, PIN-786002, Assam, India.

How to cite this article: Mondita Borgohain, Pranjal Kumar Gogoi, Sujay Karmakar, Pradeep K. Multiple myeloma presenting as spinal cord compression: a report of five cases. International Journal of Contemporary Medical Research 2017;4(4):837-839.

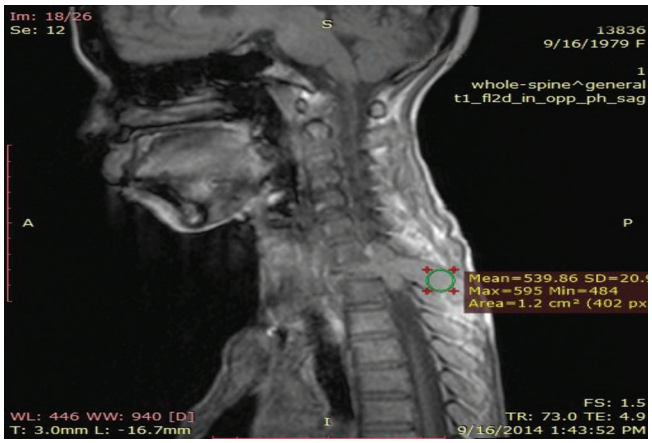

Figure-1: Spinal cord compression @ C7-T2

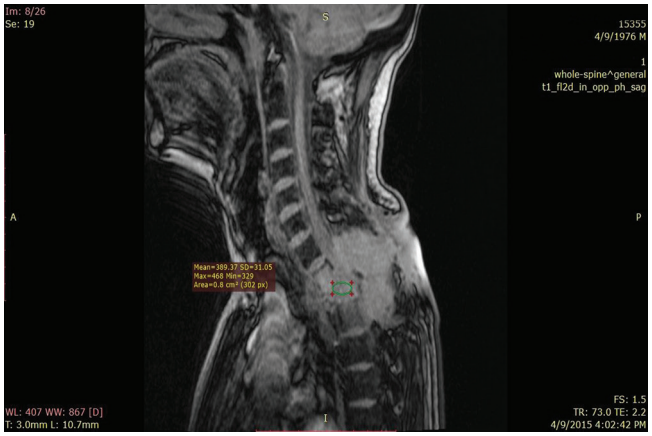

Figure-2: Spinal cord compression @ T1

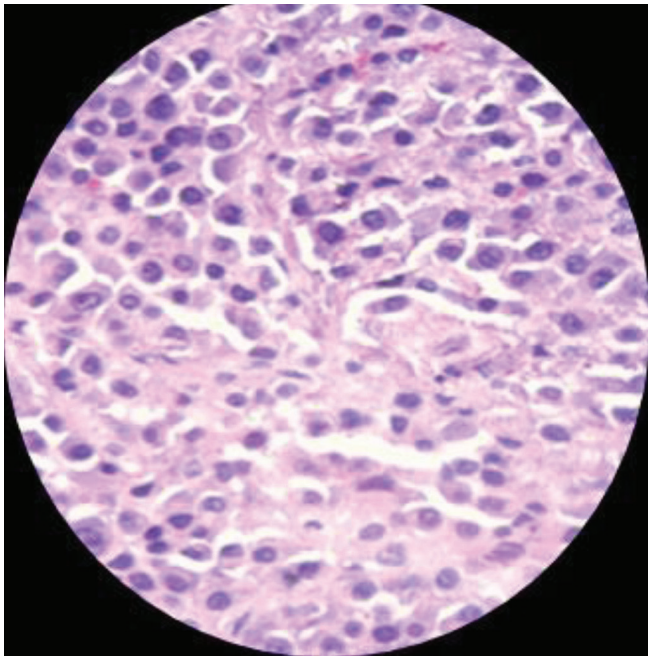

Figure-3: HPE Image showing plasma cells with, eccentric nucleus, perinuclear pale zone and basophilic cytoplasm

MRI demonstrated spinal cord compression at L1 level.

Case 5: A 64 year old male presented with chief complain of lower extremity weakness and tingling sensation. On clinical examination he had decreased superficial and deep reflexes along with reduced power of both lower limbs. M-band was detected on electrophoresis and abnormal immunoglobulin was found to be of IgG subtype. Bone marrow biopsy showed 20% plasma cells. MRI demonstrated spinal cord compression at L1 level.

DISCUSSION

The diagnosis requires ≥10% clonal bone marrow plasma cells or a biopsy proven plasmacytoma plus evidence of one or more multiple myeloma defining events (MDE): CRAB (hypercalcemia, renal failure, anemia, or lytic bone lesions) features felt related to the plasma cell disorder, bone marrow clonal plasmacytosis ≥60%, serum involved/uninvolved free light chain (FLC) ratio ≥100 (provided involved FLC is ≥100 mg/L), or >1 focal lesion on magnetic resonance imaging. Tumor burden in multiple myeloma has traditionally been assessed using the Durie–Salmon Staging (DSS) and the International Staging System (ISS).[6]

Multiple myeloma commonly present with diffuse bony involvement with predilection of the spine. A frequent complication of multiple of myeloma is pathologic fracture. Bony involvement typically is lytic nature.[7]

Another form of spinal involvement of Multiple Myeloma is spinal cord compression. 11-24% of patients of multiple myeloma demonstrate spinal cord compression.[8] Pathological fracture of the involved vertebral body or extension of a vertebral body myeloma lesion causes most spinal cord compressions.[9] MRI is the best diagnostic modality for detecting Spinal Cord compression.

These lesions should be distinguished from several other neoplastic or inflammatory conditions such as TB infections, metastatic lesions, meningioma and non-Hodgkin lymphoma. Many clinical and hematological laboratory investigations are useful to differentiate these lesions, though a histopathological diagnosis might be necessary to establish the diagnosis.

Even with proper treatment, failure of neurological recovery has been seen in many reported cases.[5] Till now, standard treatment guidelines are absent for spinal cord compression caused by multiple myeloma. Some authors approve radiotherapy along with high-dose steroid therapy as the first choice of treatment because MM is highly sensitive to radiotherapy. Timely intervention is critical for spinal cord compression by a myeloma. Surgical intervention prior to non-surgical treatment is considered in the cases presented with any worsening of the neurologic status.[10]

CONCLUSION

Spinal cord compression is an uncommon complication of Multiple Myeloma. In recent years the outcome of Multiple myeloma patients has significantly improved due to the extensive use of autologous stem cell transplantation and advanced therapies targeting both the myeloma clone and its microenvironment. Despite that, treatment of bony involvement does still represent a therapeutic challenge in these patients. Prompt diagnosis of vertebral lesions must be done in order to avoid further complications.

A multispecialty approach is essential for the diagnosis and treatment of vertebral lesions in Multiple myeloma, and collaboration between experts (radiologists, haematologists,

neurologists, orthopaedists, radiotherapists) is compulsory for an optimal management of the patients.

A diagnosis of Multiple Myeloma should be thought of in cases of spinal cord compression. Usually this complication is associated with far advanced malignancy and a poor prognosis.

REFERENCES

1. Kyle RA, Rajkumar SV. Multiple myeloma. N Engl J Med. 2004;351:1860–1873.
2. Rajkumar SV, Kyle RA. Multiple myeloma: diagnosis and treatment. Mayo Clin Proc. 2005;80:1371–1382.
3. Jemal A, Siegel R, Xu J, Ward E. Cancer statistics, 2010. CA Cancer J Clin. 2010;60:277–300.
4. Landgren O, Weiss BM. Patterns of monoclonal gammopathy of undetermined significance and multiple myeloma in various ethnic/racial groups: support for genetic factors in pathogenesis. Leukemia. 2009;23:1691–1697.
5. Palmbach M, Hoffmann W, Grodd W, Postler E, Voigt K. Extraosseous, epidural tumor spread of multiple myeloma. Eur J Radiol. 1996;22:146-8.
6. Rajkumar, S. V. Multiple myeloma: 2016 update on diagnosis, risk-stratification, and management. Am. J. Hematol. 2016;91:719–734.
7. Angtuaco EJ, Fassas AB, Walker R, Sethi R, Barlogie B. Multiple mye- loma: clinical review and diagnostic imaging. Radiology. 2004;231:11-23.
8. Wallington M, Mendis S, Premawardhana U, Sanders P, Shahsavar-Haghighi K. Local control and survival in spinal cord compression from lymphoma and myeloma. Radiother Oncol. 1997;42:43–47.
9. Innes J, Newall J. Myelomatosis. Lancet. 1961;1:239–245.
10. Ha K-Y, Kim Y-H, Kim H-W. Multiple Myeloma and Epidural Spinal Cord Compression: Case Presentation and a Spine Surgeon's Perspective. Journal of Korean Neurosurgical Society. 2013;54:151-154.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 23-03-2017; **Accepted:** 21-04-2017; **Published:** 02-05-2017