



Case Report

# Positive outcome of nonoperative management of spinal cord compression by multiple myeloma: A case report

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## ABSTRACT

**Background:** Spinal cord compression (SCC) is a severe consequence of multiple myeloma (MM). Surgical management is appropriate when there are spinal instability and neurological function compromise. The reversibility of peripheral neuropathy during treatment of MM has been reported in some studies after a cycle of Bortezomib (Velcade), Thalidomide, and Dexamethasone (VTD), but very rare in myeloma patients with SCC.

**Case Description:** We report a case of a 58-year-old male tetraplegic secondary to cervical SCC by MM who completely recovered after 5 cycles of VTD chemotherapy without surgery.

**Conclusion:** Surgical spinal cord decompression by laminectomy is known as the gold standard for treating this condition. Nevertheless, some patients can completely recover from nervous insult without surgery.

**Keywords:** Chemotherapy, Multiple myeloma, Spinal cord compression

## INTRODUCTION

Spinal cord compression (SCC) is a devastating complication of multiple myeloma (MM). In a large population-based study, the incidence of SCC in newly diagnosed MM was 7.8%.<sup>[8]</sup> For patients with neurological function compromise, surgical decompression with adjuvant therapy is the mainstay of management.<sup>[6]</sup> If not treated promptly, it could cause permanent neurologic consequences.

The surgery may be necessary to correct instability and reduce movement-induced pain. If there is spinal instability, spinal surgery is the best way to relieve acute SCC.<sup>[3]</sup> The Spine Instability Neoplastic Score is a tool to assess instability.<sup>[9]</sup>

Even after surgery, a tetraplegic patient with important craniovertebral SCC is unlikely to recover from neurologic impairments and regain daily activities. Reversibility of peripheral neuropathy during the treatment of myeloma had been reported after cycles of Bortezomib (Velcade), Thalidomide, and Dexamethasone (VTD).<sup>[7]</sup> However, it is very unusual for patients followed for SCC secondary to MM.

We report the case of a MM patient with spinal instability and SCC, who was successfully treated by nonoperative means.

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## CASE REPORT

### Patient information

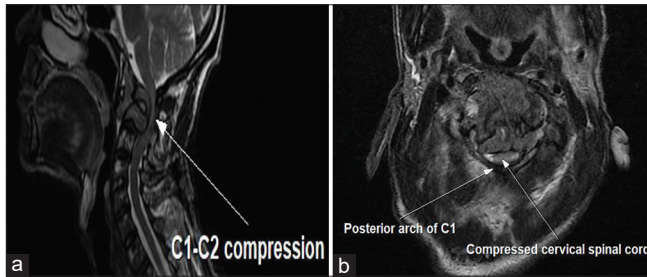
A 58-year-old male was admitted on February 19, 2022, for a 3-week history of progressive upper and lower extremities weakness. Five months earlier, the patient described increasing pain in the neck. His medical history is unremarkable.

### Clinical findings

Physical examination revealed a neurological deficit rated ASIA B. He had no dyspnea, and no bowel or bladder dysfunction. The patient had a Karnofsky Performance Score (KPS) estimated at 30%.

### Diagnostic assessment

Magnetic resonance imaging (MRI) of the cervical spine showed a hypointense signal on the T1- and T2-weighted image, corresponding to a C1–C2 lesion process with lysis and dislocation exerting a mass effect on the medullary cord [Figure 1]. There are no intramedullary signal abnormalities. Computer tomography of the cervical spine demonstrated multiple lytic lesions extending from C1 to C7 vertebral bodies, but especially in the C1 and C2 vertebral bodies, leading to a deformation of the atlantoaxial junction [Figure 2]. The Spinal Instability Neoplastic Score (SINS) was evaluated at



**Figure 1:** T2-weighted cervical spine magnetic resonance imaging revealed C1-C2 compression (white arrow) in sagittal view (a) and medullary cord mass effect (white arrows) in axial view (b).



**Figure 2:** A cervical spine computed tomography scan reveals osteolytic lesions C1-C2 (a, b) and deformation of the atlantoaxial junction (white arrow) in the sagittal view (b).

15 [Table 1]. Additional biological tests were required to rule out malignant hemopathy. The serum monoclonal gammaglobulin spike was 20.8 g/L, with IgG Kappa at immunofixation and 11% of plasmocyte cells at the myelogram, confirming the diagnosis of MM. The viral serologies were negative.

### Therapeutic intervention

After a multidisciplinary consultation meeting between neurosurgeons, anesthesiologists, and clinical hematologists, the patient was managed with a rigid adjustable cervical collar for a planned 6-month period and chemotherapy. With a 30% of KPS, this patient is less likely to support surgery.

From the February 15, to the July 17, 2022, five courses of VTD chemotherapy induction were performed. The dosage and duration were Velcade 1.8 mg per os discontinuous, Myrin 100 mg per os continuous, and dexamethasone 40 mg per os discontinuous and then repeated every 3 weeks. This medication was supplemented with antimicrobial prophylaxis

**Table 1:** The spinal instability neoplastic score.<sup>[9]</sup>

Element of SINS	Score
Location	
Junctional (occiput-C2, C7–T2, T11–L1, and L5–S1)	3
Mobile spine (C3–C6 and L2–L4)	2
Semi-rigid (T3–T10)	1
Rigid (S2–S5)	0
Pain relief with recumbency and/or pain with movement/loading of the spine	
Yes	3
No (occasional pain but not mechanical)	1
Pain free lesion	0
Bone lesion	
Lytic	2
Mixed (lytic/blastic)	1
Blastic	0
Radiographic spinal alignment	
Subluxation/translation present	4
De novo deformity (kyphosis/scoliosis)	2
Normal alignment	0
Vertebral body collapse	
50% collapse	3
<50% collapse	2
No collapse with >50% body involved	1
None of the above	0
Posterolateral involvement of the spinal elements (facet, pedicle or CV joint fracture or replacement with tumor)	
Bilateral	3
Unilateral	1
None of the above	0

Score 0–6: No surgical consultation is required; Score 7–18: Surgical consultation is advisable, SINS: The spinal instability neoplastic score. CV: Costovertebral

such as cotrimoxazole, levofloxacin and valacyclovir, Low-molecular-weight heparin, and folic acid.

### Follow-up and outcome

The patient was followed with regular clinical and biological assessments. After five courses of VTD chemotherapy, the Very Good Partial Response rate obtained was 98%. The size of the osteolytic process on C1 and C2 was decreased by 64% on a control MRI of the cervical spine [Figure 3].

The indication of an autograft was decided in the presence of an excellent response to chemotherapy induction courses. The patient underwent the autograft on August 2, 2022. He was discharged with complete resolution of neurologic deficit ASIA E. The rigid adjustable collar has been replaced by the foam cervical collar. The maintenance treatment with Velcade was continued every 2 weeks.

The patient was seen in outpatient consultation 3 months later. Physical examination found a patient in apparent good health with no neurological deficit and was pain-free [Figure 4].

### DISCUSSION

The present case described a complete recovery of SCC tetraplegic patient secondary to cervical MM without surgical laminectomy decompression.

Cervical SCC is associated with significant morbidity and mortality. It occurs at a rate of around 22.6% of cervical spine conditions. SCC appears more frequently and early in patients with MM.<sup>[1]</sup> In this situation, the surgical decompression was preconized.<sup>[1,6]</sup> However, chemotherapy has demonstrated its effectiveness in MM patients with SCC.<sup>[4,5]</sup> Chemotherapy treatment lead disrupts the interaction with the bone

microenvironment, thus inhibiting the osteoclastogenic effect and reducing inflammatory phenomena. Some authors recommend chemotherapy for SCC before surgery.<sup>[4,5]</sup> There is no consensus on the management of SCC in patients with MM. The therapeutic attitude is discussed on a case-by-case basis.

Furthermore, patients with a KPS of <50% usually have decreased life expectancy and are not candidates for surgical treatment.<sup>[3]</sup> Thus, our patient with a KPS of 30% cannot support the surgical procedure, particularly in the cervical-occipital junction.

When the spinal is unstable, surgery is the best option to restore stability. Management with osteosynthesis is not always practical due to bone deterioration in MM.<sup>[2]</sup> Anesthesia difficulties, wound infection, iatrogenic neurological injury, and metalwork failure due to low bone quality may accompany surgical management. It is crucial to avoid instrumentation in chemotherapy patients who are getting stem cell transplants because they run a high risk of developing a secondary infection of the metal.<sup>[2,3,4]</sup> Thus, for our patient, we adopted a conservative treatment with the positioning of a neck brace.

The lack of signs of myelopathy and the decrease of the inflammatory phenomenon responsible for SCC could explain our patient's neurological improvement. Immobilization with a neck brace helped relieve pain while also reducing the risk of further displacement.

Given our case and that reported by Gokaraju *et al.*,<sup>[2]</sup> it is conceivable to suggest that surgical decompression is still not the best therapeutic choice in MM, even in cases of instability. Thus, the management of secondary medullary compression in MM should be on a case-by-case basis.



**Figure 3:** T2-weighted sagittal view of the cervical spine magnetic resonance imaging after 6 months of chemotherapy.



**Figure 4:** The patient seen as an outpatient consultation 6 months later.

## CONCLUSION

The management of MM with SCC is multidisciplinary. This study shows that neck brace immobilization may have a role in the treatment of myeloma patients with mechanically unstable spines, acute SCC, and neurologic disorders. Our nonoperative management in combination with chemotherapy has proven to be safe and successful, avoiding surgery and its complications.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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