

# Metastatic spinal cord compression in a patient with multiple myeloma

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## Introduction

Multiple myeloma (MM) is a B cell malignancy resulting in osteolytic lesions.<sup>1</sup> Pathological fracture of the vertebral body resulting in spinal cord compression is a common complication and accounts for approximately 5% of patients with MM.<sup>2,3</sup> To date, there are no definitive guidelines for the treatment of metastatic spinal cord compression (MSCC) as a consequence of MM. Radiotherapy has frequently been the preferred form of treatment. Some surgeons, however, feel that spinal lesions in multiple myeloma should be treated in the same manner as spinal metastases from solid organs.<sup>4</sup>

This is a case report of the management of a 46-year-old gentleman with multiple myeloma that had resulted in MSCC in the lumbar and thoracic areas. Treatment consisted of spinal decompression and stabilisation.

The spine is the third most common site of metastases after the lung and liver.<sup>5</sup> The incidence of metastatic spinal cord compression (MSCC) is up to 80 cases per million people each year.<sup>6</sup> This equates to 4000 cases per annum in England and Wales.<sup>7</sup> Treatment traditionally involves the use of corticosteroids and radiotherapy. However, evidence has suggested that only 50% of patients have a positive response.<sup>8</sup> This case report illustrates the successful use of surgery, particularly for patients who present with neurological deficit.

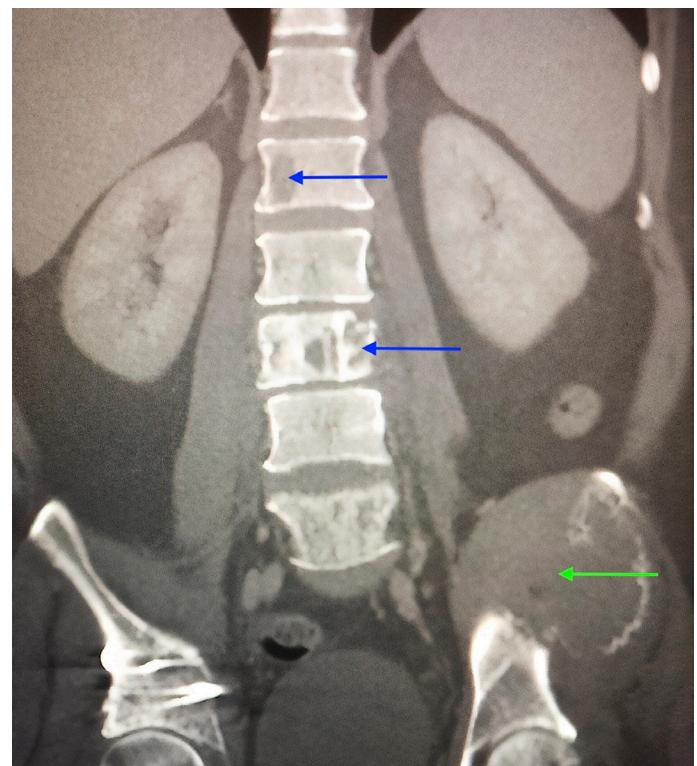
## Case presentation

A 46-year-old gentleman presented with increasing back pain and pain in the left hip for 6 months. This pain was associated with numbness in the left leg. Over the previous 2 weeks, his symptoms had become intrusive, resulting in an ability to walk only with the aid of crutches. The patient reported no weight loss and no bowel or bladder dysfunction.

On examination, there was tenderness in the lower thoracic spine, lumbar spine and over the iliac crest on the left side. Neurological examination revealed reduced sensation over the left leg from the groin to the foot. Power was reduced upon left toe extension (MRC 3/5) and ankle dorsiflexion (MRC 3/5). On the right side, sensation was reduced over the little toe. Reflexes were bilaterally brisk in the lower limbs, but plantar reflex was normal.

## Investigations

Full blood count (FBC), erythrocyte sedimentary rate (ESR) and calcium levels were normal. CT scanning revealed multiple areas of bony destruction in the vertebrae and left iliac bone (**Figure 1**). MRI revealed destruction of T5, T10, L3 and L5 vertebrae with abnormal tissue causing severe compression of the spinal cord and nerves in these areas. Plasma electrophoresis was performed to check for multiple myeloma; this was positive for the presence of free light chains.



**Figure 1. CT scan of the spine and pelvis.** The CT scan highlights multiple areas of bony destruction in the thoracic and lumbar vertebrae (blue arrows). There is a large mass in the left iliac bone (green arrow).

## Differential Diagnosis

Tuberculosis can present similarly to MSCC, in that spinal canal involvement can cause radiating pain and limb weakness.<sup>9</sup> However, tuberculosis was an unlikely diagnosis. The typical manifestations of spinal tuberculosis involve vertebral bone destruction, narrowing of intervertebral disc space and paraspinal abscess.<sup>9</sup> Despite MRI revealing vertebral bone destruction, there was no evidence of paraspinal abscess.

The possibility of osteomyelitis was also ruled out upon haematological testing. ESR in osteomyelitis tends to be raised to a level greater than 100 mm/hour.<sup>10</sup> However, the patient had a normal ESR and did not present with features of systemic infection.

Lastly, the probability of MSCC was increased by the presence of both motor and sensory symptoms. Radicular pain and sensory complaints tend to be initial symptoms in patients with lumbar metastases, whereas weakness in the limbs is more pronounced in patients with thoracic metastases.<sup>11</sup> As T5, T10, L3 and L5 were all affected, it was concluded that the patient would be treated for MSCC.

## Treatment

The aim of treatment would not be curative, but rather aimed at improving quality of life.<sup>12</sup> Surgery was preferred and initially consisted of tumour tissue biopsy. Subsequently, the patient underwent spinal decompression and spinal stabilisation at the lumbar and thoracic areas (**Figure 2**). Post-operative radiotherapy was initiated in line with The National Institute for Health and Care Excellence (NICE) guidelines.<sup>13</sup>



**Figure 2. Post-operative x-ray.** Post-operative x-ray demonstrating spinal stabilisation at the lumbar and thoracic areas using rods and screws.

## Outcome and follow-up

The operation was successful, with numbness in the left leg improving within 4 days. The pain subsided within 1 month and the patient could walk short distances without the use of crutches. At 1-year follow-up, the patient regained full function of the spine and hip. Ambulation status was restored, and lower limb power returned to normal (MRC 5/5).

## Discussion

MSCC may be the presenting symptom of cancer, as highlighted in this case. A retrospective cohort study reported that 21% of MSCC patients had no pre-existing cancer diagnosis.<sup>14</sup> Lower back pain may be the first sign of malignancy. Considering that lower back pain is prevalent in our population, it is unsurprising that the diagnosis of MSCC is often missed. In an observational study of 319 patients with MSCC, a median of 2 months passed from the onset of pain and the diagnosis of the condition.<sup>6</sup> Similarly, in this case, the patient's back pain was not investigated for 6 months. It required the onset of motor deficit and limb weakness for red flags to be raised. In view of this, clinicians should maintain a high index of suspicion of MSCC in a patient presenting with progressive lumbar and thoracic pain. Early detection is pivotal in preserving motor and sensory function.

This case outlines the efficacy of both MRI and CT scanning in the diagnosis of MSCC. MRI is the gold-standard investigation and concurs a sensitivity and specificity of 100% and 93%, respectively.<sup>15</sup>

Furthermore, CT scanning, used in conjunction with MRI, can aid in preoperative planning and help detect the site of the primary tumour.<sup>12</sup>

Research has shown that surgery for MSCC can provide an improvement in pain, function and ambulation status. This is in comparison with patients receiving only radiotherapy as treatment for MSCC.<sup>16</sup> NICE, therefore, recommends spinal decompression and stabilisation for patients who are deemed fit.<sup>17</sup> Post-operative radiotherapy can be used in conjunction with surgery to treat further metastases. The success of this type of treatment was assessed in a prospective randomised control trial, which showed that patients with MSCC treated with direct decompressive surgery plus post-operative radiotherapy retained the ability to walk for longer than patients treated with radiotherapy alone.<sup>8</sup> Surgical treatment further reduced the need for corticosteroids and resulted in increased survival time.<sup>8</sup> However, survival time was dependent on metastatic spread.

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