

# Intramedullary Spinal Cord Metastasis Presenting With Acute Quadriparesis: A Case Report

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## Abstract

Intramedullary spinal cord metastasis (ISCM) is a rare albeit well described complication of some tumors. In this article, the authors present a case of a 53-year old immigrant woman with disseminated breast carcinoma who presented with numbness and weakness in the left arm progressing to acute quadriparesis over a short interval of time. The case highlights and reinforces the devastating neurological deficits associated with ISCM if they are not detected and treated within an appropriate timeframe.

## CASE REPORT

A 53-year-old woman presented to the emergency department with a complaint of progressive left arm numbness and weakness over four months. She had self-diagnosed her breast cancer a year and a half before presentation, but had sought no treatment for it due to social reasons. The patient was an immigrant, working in the United States for the past 5 years as a home health aid. She was uninsured. At the time of presentation, she denied any back or neck pain. The patient was seen in the emergency department, and as her case did not appear to be acute it was decided that she would follow up as an outpatient. While awaiting discharge, she developed progressive descending weakness, leaving her quadriparetic and incontinent of bladder and bowel. Neurological examination revealed an anxious woman with flaccid quadriparesis. Power in the upper limbs was 2/5 MRC grade (the patient was able to draw her arms across her chest), and 1/5 MRC grade in the lower limbs. The patient had bilateral Babinski signs and a variable sensory level between C3-5. MRI of the cervical spine revealed an intramedullary spinal cord lesion extending from C3 to C5. On breast examination, a scirrhous left breast with a peau d'orange appearance was noted, fixed to the anterior chest wall with cervical and axillary lymphadenopathy. She was treated with high dose steroids and fractionated radiotherapy while pending further workup. Punch biopsy of the breast lesion showed a stage IV intraductal carcinoma. The metastatic evaluation revealed the intramedullary lesion, multilevel vertebral body disease, no epidural deposits and no other bone or organ involvement. The patient was offered emergent

neurosurgical treatment with laminectomy and cytorreduction, but due to the seriousness of the risks, the patient refused. The patient finished her course of corticosteroids and radiotherapy, and was started on chemotherapy. Her neurologic function showed no reversibility and progressed to spastic quadriplegia over the following month.

## DISCUSSION

Spinal cord tumors may be either primary or metastatic, and are further categorized by location: extradural, intradural-extradural or intramedullary. Intramedullary spinal cord lesions comprise only 1-5% of spinal cord tumors<sup>1, 2</sup>. The majority are primary gliomas, while intramedullary spinal cord metastases (ISCM) account for only 1-3% of all intramedullary neoplasms<sup>1,2,3,4,5</sup>. ISCM are associated primarily with lung carcinoma (50%), especially small cell type, breast carcinoma (13%), melanoma (9%), lymphoma (5%) and renal cell cancer (4%) and are usually diagnosed well into the course of primary disease<sup>1,2,4</sup>. As many as 2% of patients in the end stages of disseminated cancer are found to have ISCM. This number is expected to grow with the increasing availability of improved diagnostic imaging, predominantly MRI, which has become the gold standard for diagnosis and evaluation of these rare tumors. A biopsy is often required for definitive diagnosis of the lesion as metastasis versus primary tumor and can help tailor therapeutic approach<sup>5</sup>.

Presenting symptoms of ISCM usually consist of weakness, followed in frequency by sensory loss, pain and bowel and

bladder disturbance. Weakness and pain present early, as compared to sensory loss, with sphincter disturbance having the latest onset. ISCM are therefore difficult to distinguish clinically from extradural tumors, which often present with a similar constellation of symptoms. Unlike extradural lesions, and exemplified by this case report, intramedullary lesions may first present with asymmetric or unilateral symptoms<sup>6</sup>. ISCM can be distinguished clinically from primary tumors by the rapidity of onset of symptoms. A cause of the sudden onset of motor symptoms may be a vascular event in the tumor bed, such as a venous infarct. Neurological deficits tend to be irreversible, especially if severe motor weakness and bladder/bowel involvement are noted at the time of first presentation.

Prognosis of these metastases is guarded, compounded by both treatment modality and tumor type, with lung and breast metastases correlating with the shortest survival<sup>4</sup>. Treatment of choice for ISCM consists of immediate steroid bolus, radiation and chemotherapy with subtotal cytoreductive surgery considered on a case by case basis. High dose dexamethasone may allow for limited and transient neurological improvement, while radiotherapy often results in stasis of the deficit without improvement. However, in combination with chemotherapy, radiation correlates with an increased length of survival. In one review of 177 cases, steroids gave approximately 5 weeks of survival, compared to radiation and radiation with chemotherapy allowing for approximately 15 and 29 weeks of survival, respectively<sup>4</sup>. Cytoreductive surgery is another treatment option for lesions early in the course of neurological deficits, and is associated with a 75% increase in time of "high quality of life" survival<sup>3</sup>. It has not been found to increase the length of survival as compared to other treatment modalities<sup>4</sup>. Our patient presented late in her course, with a high lesion in the cervical cord. Her surgery carried the specific risks of increasing cord edema, resulting in the need for long-term mechanical ventilation and worsening neurological deficits. In the face of these risks and the poor temporal prognosis associated with her breast cancer, it was felt by us that the risks of such surgery were too great. It is likely that the surgical risks would have been

minimized had the patient presented with a smaller lesion prior to the precipitous event that caused her such sudden quadriparesis. Such early presentation was precluded in our case due to the patient's perceived exclusion from the healthcare system because of her immigrant status and her lack of insurance.

### **CONCLUSION**

Our patient presented with numbness and weakness in one arm, but progressed to quadriparesis in less than 24 hours. This case therefore highlights and reinforces the devastating neurological deficit associated with ISCM if they are not detected and treated in an acute timeframe. It is unfortunate that, in our case, such devastation must be taken in context of the patient's social status and limited access to care. Following review of the literature, this case is informative in that weakness was the presenting complaint of the breast cancer, pain was not reported by the patient thereby delaying the time of her presentation to the hospital and the lesion been high cervical, thus significantly limiting the treatment options due to the associated risks of surgery.

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