



# Machine Operator with Central Cord Syndrome: A Case Report

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## INTRODUCTION

Central cord syndrome (CCS) is most commonly caused by cervical spine trauma with an incidence of 11,000 cases annually in the United States<sup>4</sup>. CCS is the most common type of incomplete spinal cord injury, making up 15-25% of cases. There is a bimodal distribution of patients with CCS: age less than 50 years after high-energy spinal traumatic injury and age greater than 50 years after hyperextensive injury with underlying spondylosis. Spondylosis predisposes a person to spinal cord injury by hyperextension mechanism, resulting in compression of the spinal cord between buckled ligamentum flavum and hypertrophic spondylotic disc and damage to central spinal cord neuronal tracts<sup>1, 3</sup>.

Injury to the central portion of the spinal cord disrupts the medial lamination of the cortical spinal tracts that control the hand and upper extremity functions while sparing the lateral tracts that control the sacral and lower extremity function. The presentation of CCS includes disproportionate motor impairment of upper extremities more than the lower extremities, bladder dysfunction, and varying degrees of sensory loss below the level of lesion<sup>2, 3</sup>. The spectrum of CCS can present from weakness solely in the hands and forearms with sensation intact to complete quadriplegia with sacral sparing.

## CASE DESCRIPTION

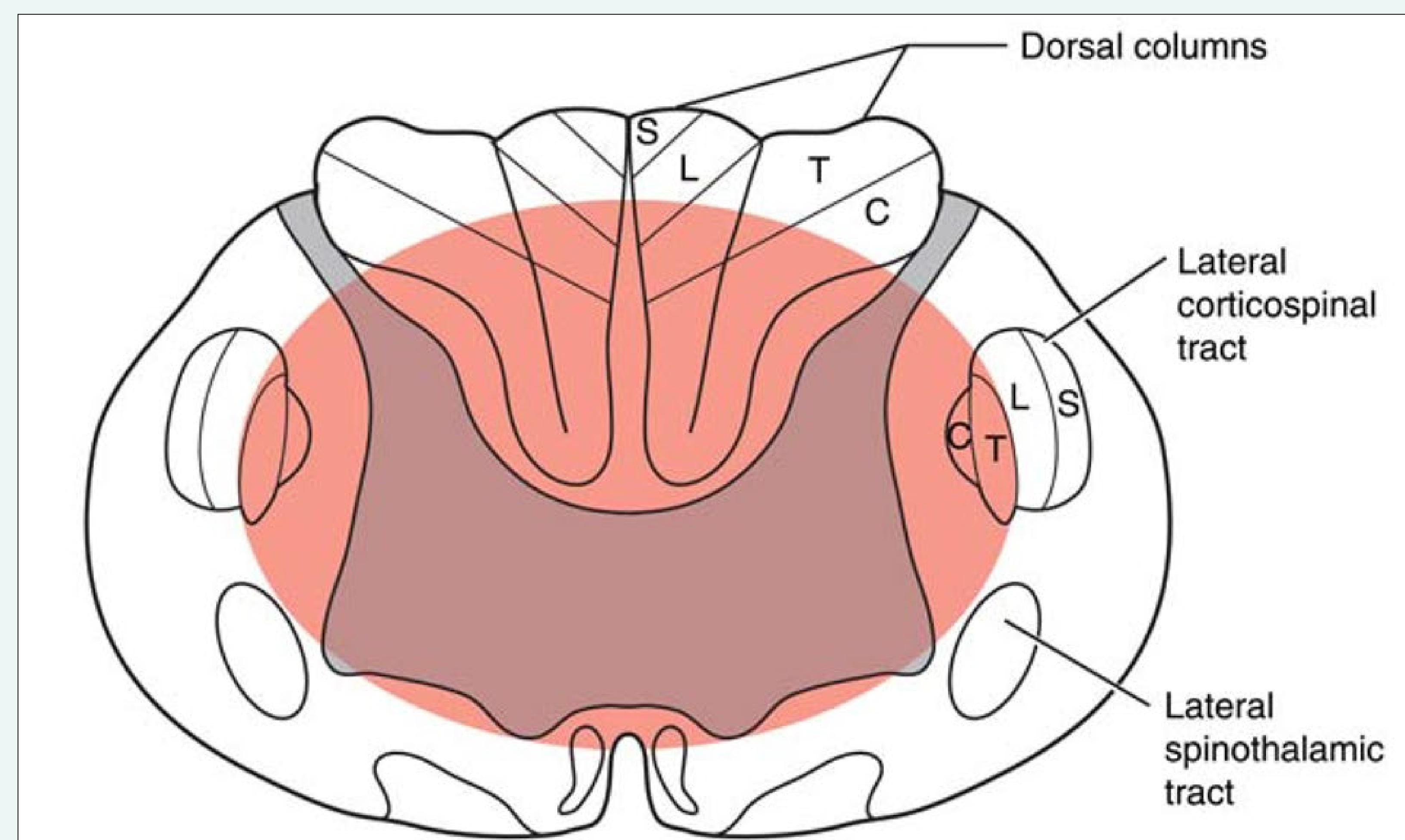
A 30-year-old male, who sustained a cervical spine injury at work that caused central cord syndrome and was status post 4-months C3-C4 posterior cervical laminectomy for cord decompression, presented for evaluation of neck and back pain. He had sharp, throbbing neck pain with associated headaches, photophobia, paresthesia and shooting pain in upper extremities, and weak grip strength. He also had low back pain with tingling in lower extremities. Physical exam was remarkable for clonus in the left upper extremity, brisk reflexes in the right upper extremity, and brisk reflexes in lower extremities with clonus. There was 2/5 and 4/5 muscle strength in the right and left upper extremity, respectively. While he had decreased sensation in all extremities, his sensation was decreased in the upper extremities more than the lower extremities.

## RESULTS

Magnetic resonance imaging (MRI) of the cervical spine showed focal cord edema at C4 level, likely due to contusion. MRI of the thoracic and lumbar spine were unremarkable. Given the imaging and clinical presentation, he had CCS with neurological level of injury at C4 along with neurogenic bladder and bowel.

After seven months since the C3-C4 laminectomy and 2-month treatment with pain management, patient continued to demonstrate decreased sensation in the upper and lower extremities bilaterally (left > right), clonus in left upper extremity, and brisk reflexes in both upper and lower extremities but improved muscle strength in the upper extremities.

## FIGURE 1. CENTRAL CORD SYNDROME ILLUSTRATION



## FIGURE 2. MRI OF CERVICAL SPINE



## DISCUSSION

The early diagnosis of cervical spine trauma induced tetraplegia is important since failing to recognize the initial injury leads to a 3% rate of neurologic deterioration. Delayed decompression of persistent spinal cord compression can lead to significant neuronal improvement, compared to conservative treatment. Patients who underwent surgical decompression also have a shorter hospitalization and rehabilitation period<sup>1, 2</sup>.

Lateral corticospinal tract is affected, especially the cervical and thoracic tracts that contribute to upper extremities, resulting in disproportionate motor impairment in the upper extremities, compared to lower extremities. Neurologic function tends to return in this order: lower extremities, bladder, proximal upper extremities, and hands, but the hands have the most limited recovery<sup>1, 2</sup>.

There is still controversy about the timing of surgery for patients with CCS, but surgical intervention is standard of care for traumatic cord injuries. Such as acute traumatic myelopathy (ATM)<sup>1</sup>.

## CONCLUSION

This case illustrates that early surgical intervention can prevent paralysis after a spinal cord injury and improve recovery of CCS. The majority of patients have recovery with medical treatment to some degree. However, early surgical decompression of persistent cord compression or correction of spinal instability may provide maximal neurologic recovery and prevent a delayed neurologic deterioration<sup>2</sup>. Rapid recognition of neurological deficits and diagnosis of CCS is important for the early management of incomplete spinal cord injury and the patient's prognosis and recovery.

## ACKNOWLEDGEMENTS

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