

Traumatic Injury Resulting in Complex Regional Pain Syndrome Alleviated Following Implantation of Cervical Spinal Cord Stimulator

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Highlights

- 29 y/o female diagnosed with CRPS following MVC rollover
- Symptoms included pain in left neck/shoulder/axilla, cyanosis of the affected area, temperature changes, heat/cold intolerance and hypersensitivity
- Diagnosis of CRPS consistent with Budapest Criteria
- Failed conservative measures including physical therapy, injections, and medication management
- Cervical spinal cord stimulator implantation at the C2 and C6 levels
- Reported a 70-80% relief of pain as well as improvement in function

Background

Complex regional pain syndrome (CRPS) is a rare and perplexing chronic regional pain disorder that can present many challenges with its management and occasionally requires advanced treatment modalities. It is characterized by hyperalgesia, allodynia, edema, motor disturbance, vasomotor instability, and typically occurs following surgery or trauma. In type-I CRPS there is no confirmed nerve injury, while peripheral nerve injury is present in type-II CRPS. Changes in the understanding of the illness over time have made diagnosing and managing CRPS challenging. Furthermore, a CRPS diagnosis cannot be confirmed by a single test, and so clinical diagnostic criteria for CRPS have been developed by clinicians and researchers. The Budapest Criteria is currently the most-accepted diagnostic criteria. Despite receiving treatment, many patients have a poor prognosis, and their quality of life can be severely impacted. Reducing disease progression and improving quality of life requires early diagnosis and initiation of treatment.¹

Case

This case involves a 29-year-old female diagnosed with CRPS Type 2 of the LUE following an MVC rollover in 2012 resulting in winging of her scapula and chronic pain. In 2022, her symptoms worsened following a chiropractor adjustment. Her symptoms and presentation progressed to involve extreme pain in her left neck/shoulder/axilla, cyanosis of the affected area, temperature changes, heat/cold intolerance and hypersensitivity consistent with a diagnosis of CRPS. In the interim, the patient has failed conservative measures including physical therapy, injections, and medication management. The patient was seen by neurosurgery, orthopedic surgery, PM&R, and prior interventional chronic pain specialists. As part of this multidisciplinary workup, the etiology of the patients’ pain remained unclear with numerous diagnostic modalities including advanced imaging and EMG. After extensive discussion with the patient regarding existing treatment options, the decision to proceed with a cervical spinal cord stimulator was made. On 11/16/23, trial spinal cord stimulator leads were placed successfully. Positioning was accessed via the T3-4 interspace using a paramedian LOR technique with leads terminating at the top of C2 and C6. Lead placement was chosen to capture the dorsal scapular nerve takeoff and brachial plexus, along with traditional LUE. During follow up, the patient reported up to 65% relief in her left scapular region and near resolution of the left axillary pain. She was able to complete all tasks of daily living without increases in her pain. Following a successful trial, the patient elected to proceed with implantation on 1/11/24. The leads were placed in a similar fashion at the C2 and C6 vertebral body. The patient healed postoperatively without complications and during initial follow up in clinic, reported a 70-80% relief of pain as well as improvement in function.

Table 1:

The Budapest Criteria for Complex Regional Pain Syndrome (CRPS)	
X	1. Continuous pain disproportional to the inciting event
X	2. At least one symptom in greater than or equal to three of the following categories
X	- Sensory (hyperesthesia, allodynia)
X	- Vasomotor (temperature asymmetry, skin color changes, skin color asymmetry)
	- ~~Sudomotor~~ /Edema (edema, sweating changes, sweating asymmetry)
X	- Motor/Trophic (decreased range of motion, weakness, tremor, dystonia, trophic changes affecting the skin, nails, hair)
X	3. At least one sign present upon evaluation in greater than or equal to two of the following categories
X	- Sensory (Evidence of hyperalgesia and/or allodynia)
X	- Vasomotor (Evidence of temperature asymmetry and/or skin color changes/asymmetry)
	- ~~Sudomotor~~ /Edema (Evidence of edema and/or sweating changes asymmetry)
X	- Motor/Trophic (Evidence of decreased range of motion and/or weakness, tremor, dystonia and/or trophic changes affecting the skin, nails, hair)
X	4. Absence of another diagnosis that would better explain the symptoms and signs
X = positive finding with patient presentation. A patient is diagnosed with CRPS, if all four criteria are met. For research classification at least one symptom from all four categories and at least one sign from all categories should be attested. Table adapted from [4].	



Image 1: Lateral view demonstrating posterior position of both leads at C2 and C6.

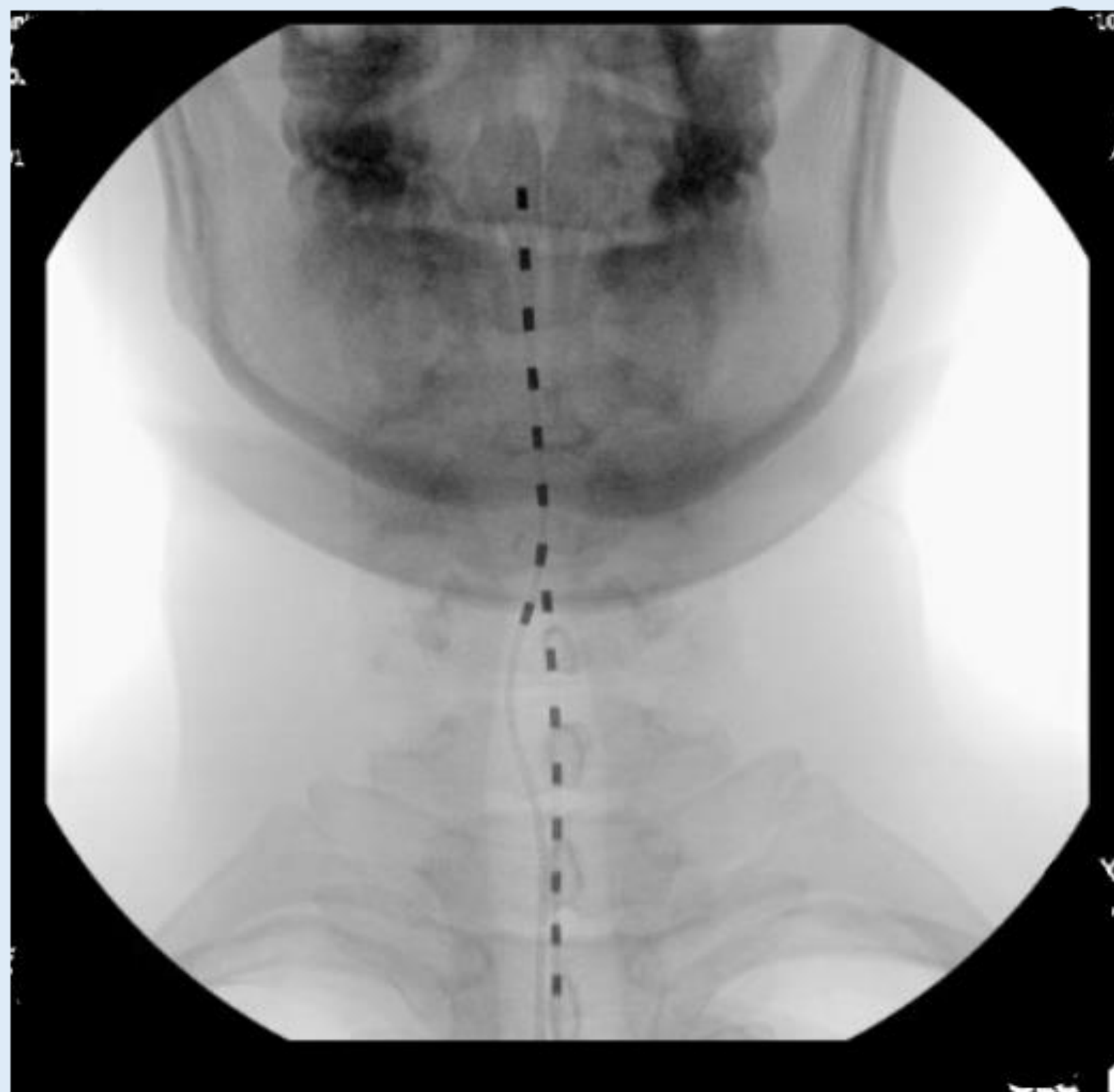


Image 2: AP view with leads terminating at the top of the C2 and C6 vertebral body taken at 5 months postoperatively.

Discussion

As seen within this case, the treatment of CRPS presents many challenges, particularly for patients escalating through conservative measures while enduring the pain and lifestyle modifications of this syndrome. Though preoperative selection plays a crucial role, fortunately for this patient population, multiple studies have shown that spinal cord stimulation is a promising option.² Numerous studies have demonstrated pain scores, and psychological distress are often improved following SCS implementation, and this treatment modality should be kept in mind for therapy refractory cases.³

References

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