

Introduction

- The nucleus caudalis (NC) is a division of the spinal trigeminal nucleus where second-order neurons receive nociceptive input from the trigeminal nerve.
- The caudal portion of NC extends to the C2-C3 level becoming continuous with the substantia gelatinosa of the dorsal horn.
- The NC has been targeted with surgical ablative procedures in the treatment of various craniofacial pain syndromes that are refractory to conservative treatment.
- Spinal cord stimulation has been utilized in the treatment of various neuropathic pain conditions and represents a reversible and non-destructive alternative to surgical ablative procedures.
- In this case report we present 4 cases in which a high cervical spinal cord stimulator (SCS) is used to treat post-herpetic neuralgia in the V1 distribution by targeting the NC.

Methods

- After Institutional Review Board approval, a retrospective chart review was conducted to identify patients who have a diagnosis of facial post-herpetic neuralgia who underwent SCS implants between 2022 and 2024 at the University of Utah.
- Medical records were reviewed for the following: age, sex, race, medications usage history before and after implant, SCS trial results, and Brief Pain Inventory (BPI) scores at baseline, 1-month and 3-months after implants.

High cervical SCS may be a non-destructive and reversible treatment option for patients with post-herpetic neuralgia in the V1 distribution.

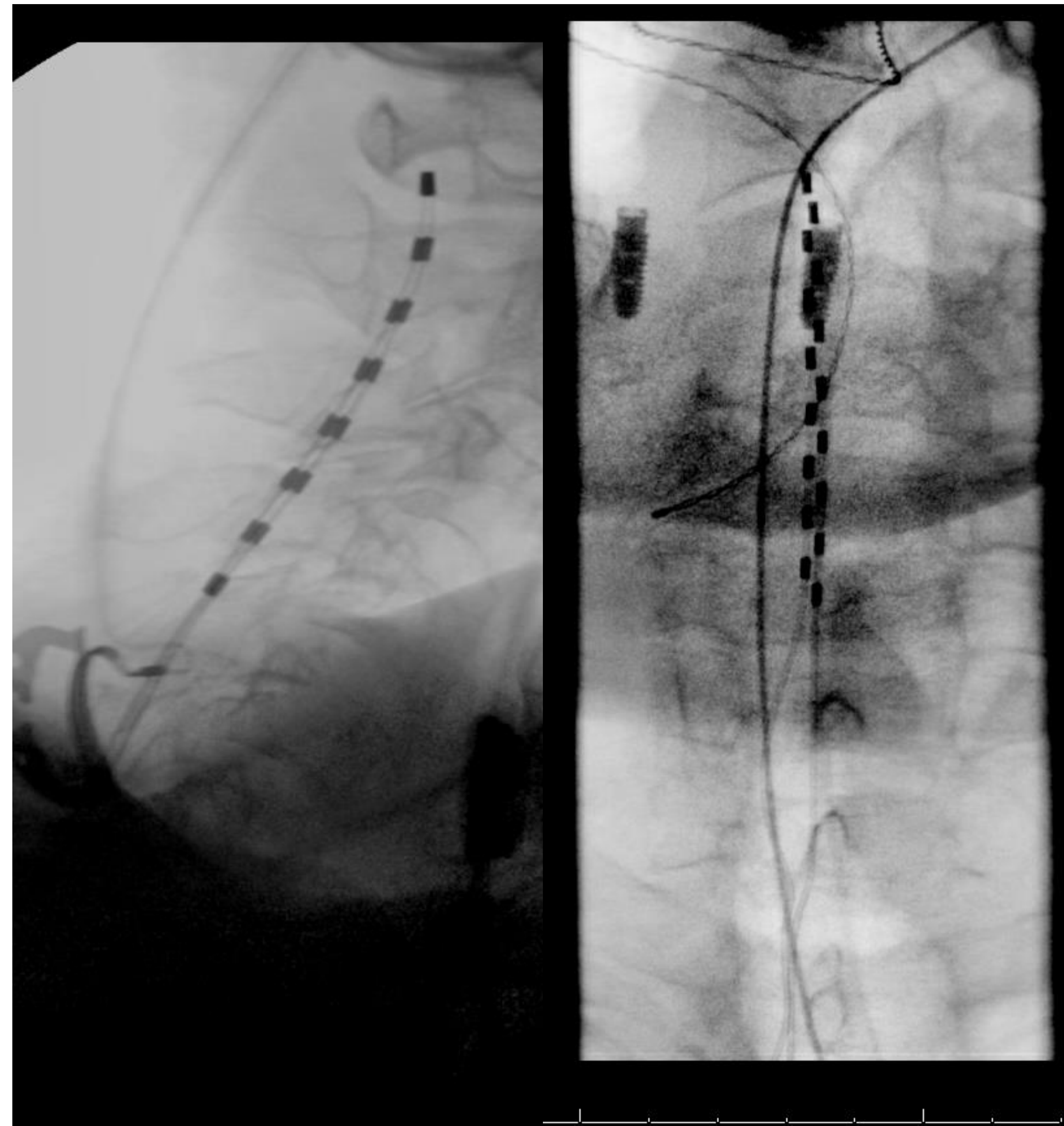


Figure 1: Lead placement for the permanent implant for patient A.

Key

BPI-P = Brief Pain Inventory – Pain score

BPI-PI = Brief Pain Inventory – Pain interference score.

Patient ID	Age (Yr)	Sex	Race	Diagnosis	Failed Medications	Pre-trial Medications
A	65	M	White	Post-herpetic neuralgia, V1	Gabapentin 600mg TID Pregabalin 150 mg BID Duloxetine 60 mg daily Nortriptyline 75mg daily Memantine 10mg TID	Oxcarbazepine 300 mg BID
B	53	F	White	Post-herpetic neuralgia, V1	Gabapentin 600mg TID Pregabalin 150 mg BID Duloxetine 60 mg daily	Norco 5/325mg Q8H
C	58	F	White	Post-herpetic neuralgia, V1	Gabapentin 600mg TID Pregabalin 150 mg BID Duloxetine 60 mg daily	Norco 5/325mg Q8H
D	70	M	White	Post-herpetic neuralgia, V1	Gabapentin 600mg TID Pregabalin 150 mg BID Duloxetine 60 mg daily	Norco 10/325mg Q8H

Table 1: Demographics, disease characteristics and pre-trial treatments.

				Pre-implant		Post-implant 1 month follow-up		Post-implant 3 months follow-up		
Patient ID	Trial lead location	Trial pain relief	Proceed to implant?	BPI-P	BPI-PI	BPI-P	BPI-PI	BPI-P	BPI-PI	Medications
A	C2	70%	Yes	7.3	7.0	2.8	1.0	1.0	1.0	Oxcarbazepine 300 mg BID
B	C2	75%	Yes	7.8	7.3	2.0	0.8	1.0	0.8	None
C	C2	70%	Yes	6.6	6.2	1.5	1.8	1.5	1.7	None
D	C2	55%	No	8.0	8.3					Norco 10/325mg Q8H

Table 2: Results from the trial, changes in the BPI scores and changes in medication utilization.

Discussion

- Four patients with trigeminal neuralgia in the V1 distribution underwent high cervical SCS trial and 3 patients proceeded to permanent implantation.
- Table 1 shows patient demographics and pre-implant treatment history.
 - Age ranged between 53 and 70 years, half of the patients were female, and all patients were white.
- All patients failed at least two neuropathic agents.
- Three patients were on opioids and one patient was on a neuropathic agent before SCS trial.
- Table 2 shows SCS trial results, and medication usage and BPI scores at baseline, 1-month, and 3-months post-implant.
 - Three patients received $\geq 70\%$ pain relief during trial and proceeded to implant.
- Two patients who were on opioids at baseline were able to discontinue them at 3-months post-implantation.
- All patients experienced >3 points decrease in average BPI pain and pain interference score.
 - The Minimal Clinically Important Difference (MCID) is 2.2 for BPI instrument.
- There were no complications reported by any of the patients.

References

Santyr B, Abbass M, Chalil A, Vivekanandan A, Tindale M, Boulis NM, Lau JC. Surgical Interventions Targeting the Nucleus Caudalis for Craniofacial Pain: A Systematic and Historical Review; 2023. Neuromodulation;26(8):1480-1492.