

Stellate Ganglion Block for PTSD & Chronic Low Back Pain

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Introduction

- Stellate ganglion blocks (SGB) have effectively been utilized in treatment-resistant post-traumatic stress disorder (PTSD), refractory chronic pain, and complex regional pain syndrome (CRPS).
- The overlapping pathophysiology of these syndromes may contribute to the success of the SGB in alleviating seemingly distinct indications.
- Precision medicine includes the utilization of therapies that can maximize benefit based on individual patient factors.
- Due to the co-occurrence of chronic pain and PTSD, it is important to investigate therapies that may be able to simultaneously address both issues.

Objective

The authors present the first novel case of the successful use of a SGB in the treatment of PTSD, chronic myofascial pain, and chronic low back pain in a single patient.

Case Presentation

- 40-year-old female veteran, with a past medical history of treatment-resistant PTSD
- Evaluated for chronic myofascial pain; Low back pain and bilateral, non-radiating, neck and posterior arm pain
- Cervical and lumbar MRIs revealed multilevel degenerative discogenic disease and neural foramina narrowing
- The patient failed both conservative and non-conservative interventional pain treatment options, including duloxetine, gabapentin, hydrocodone, epidural steroid injection, radiofrequency ablation, and peripheral nerve stimulation.
- The patient also failed multiple medication trials for PTSD, including numerous SSRI's and prazosin, as well as topiramate and gabapentin for associated anxiety and mood stabilization.
- An SGB was recommended to control PTSD symptoms and to possibly address her upper extremity pain (Fig.1).

Results

The patient's chronic low back pain, myofascial pain, and PTSD symptoms were assessed prior to the procedure, and then after 1 day, 1 week, and 6 weeks post procedure. PTSD symptoms were evaluated using the CAPS-5 and pain symptoms were assessed on a scale of 1-10. Table 1 shows the patient experienced both an improvement in pain scores and an improvement in PTSD symptoms following the Stellate Ganglion Block.

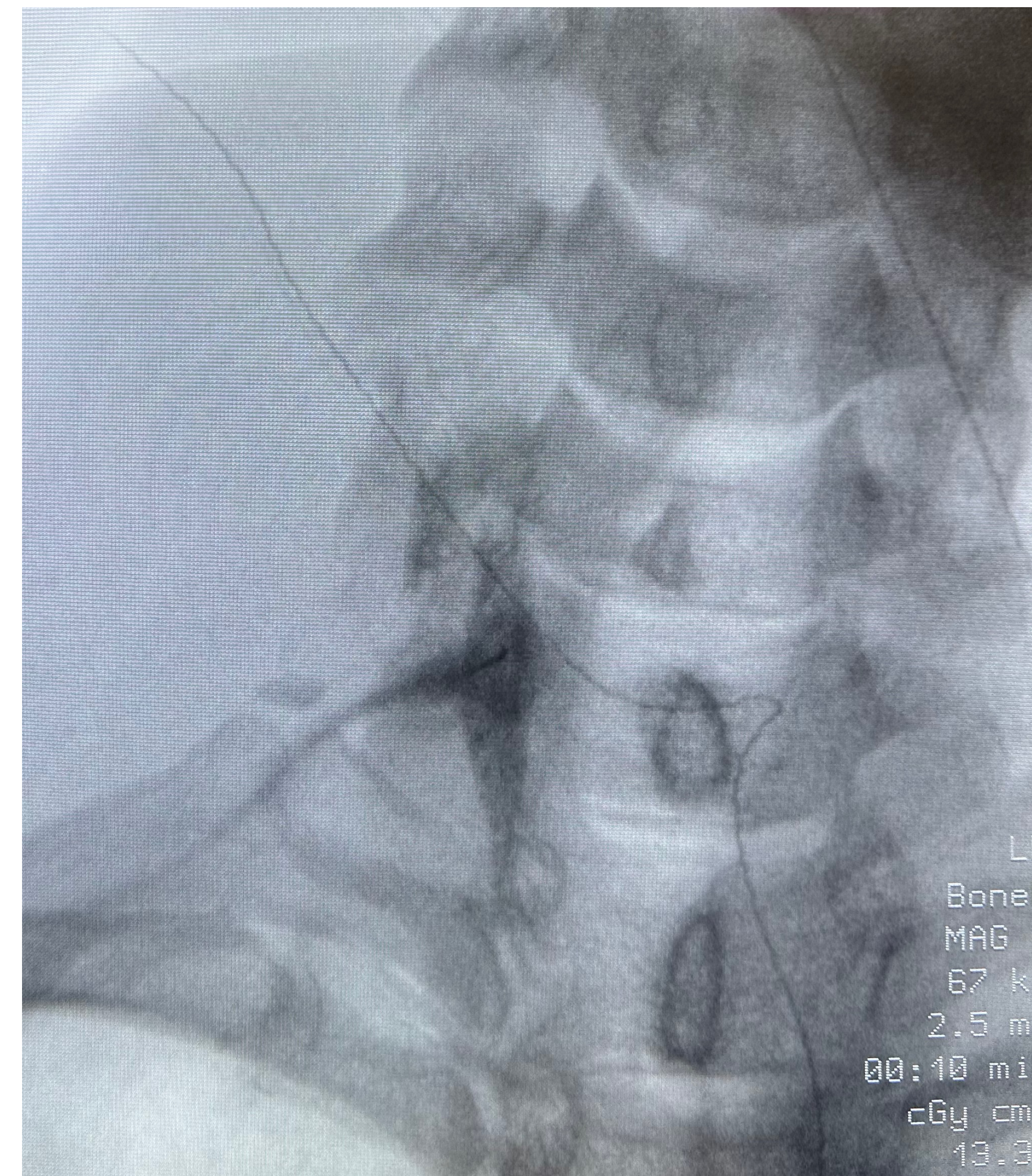


Figure 1. Fluoroscopically-Guided Right Stellate Ganglion Block (Patient #1).

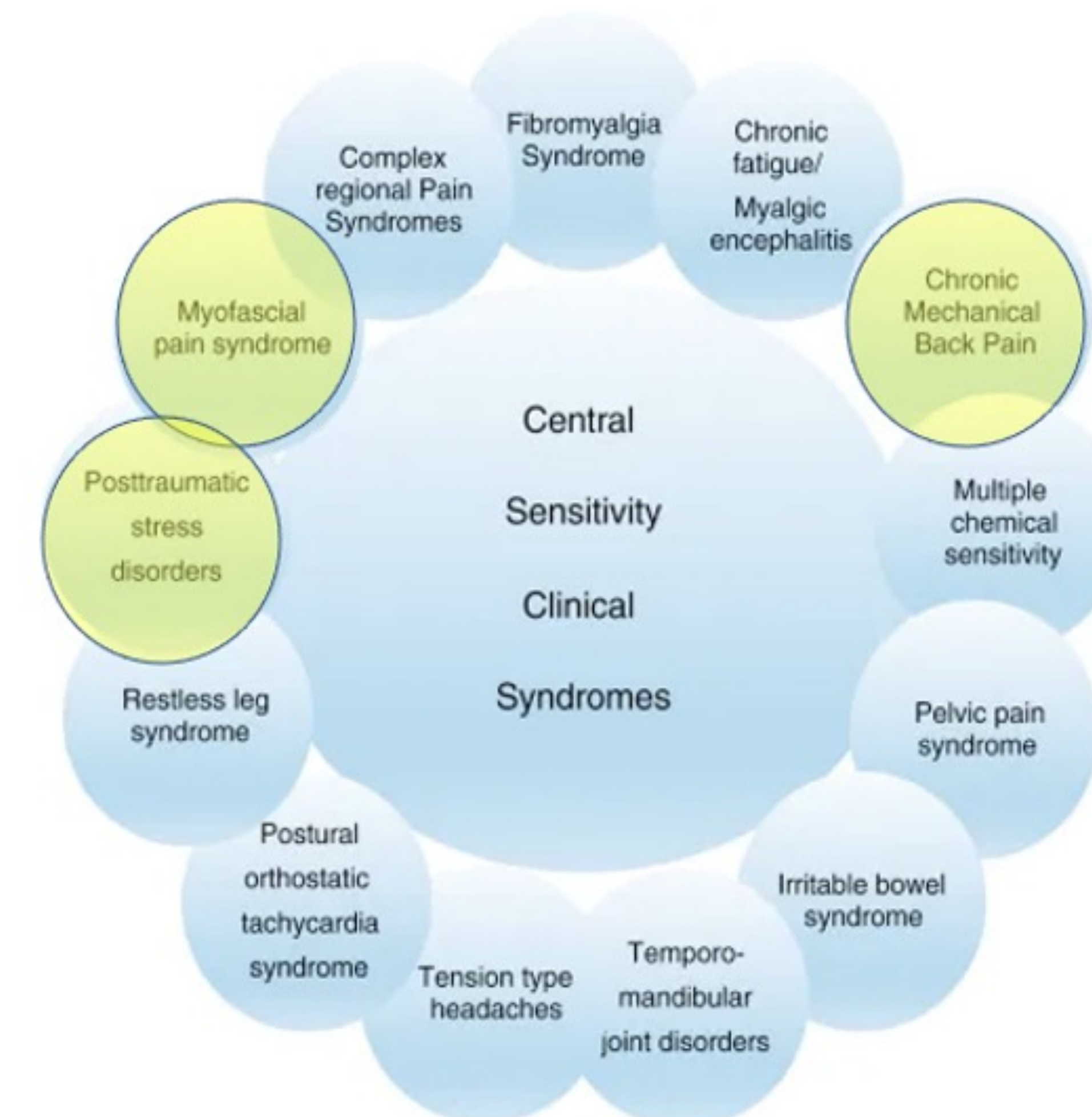


Figure 2. Central Sensitization Syndromes. From Yunus MB. Central sensitivity syndromes: a new paradigm and group nosology for fibromyalgia and overlapping conditions, and the related issue of disease versus illness. *Semin Arthritis Rheum*. 2008;37(6):339–352; with permission. Image was modified with highlighting to reflect the syndromes present in this case presentation.

Discussion

- The Stellate Ganglion (SG) is a sympathetic ganglion consisting of the 6th and 7th cervical vertebrae and first thoracic sympathetic ganglia, and its block allows for a broad sympathetic blockade^{1,2}
- The underlying mechanisms of PTSD and conditions such as Chronic Low Back pain and CRPS can be linked under the umbrella of Central Sensitization
- Central Sensitization is a term that covers a wide range of clinical disorders (Fig.2), all related to amplification of pain reception by the CNS³
- The SGB has been widely used, particularly in Military settings, for the use of PTSD in veterans due to its ability to blunt the increased noradrenergic activity seen in PTSD patients.⁴
- One study proposed a mechanism for the underlying efficacy for SGBs in CRPS and PTSD, which involved the increased release of Nerve Growth Factor in pathological states, leading to an increase in Norepinephrine and sympathetic hyperactivity.⁵
- The successful results of the SGB in the treatment of both PTSD and chronic myofascial pain reinforces an association between the two pathologies
- While SGBs have been used for the treatment of CRPS, the true novelty of this particular case series lies in the improvement of the low back pain.
- Pressure algometry studies have shown patients suffering from LBP have significantly lowered pressure pain thresholds and hyperalgesia both in their back and peripheral sites.⁶
- Study conclusions have shown individuals with LBP have decreased pain thresholds, increased pain responses, and prolonged duration of pain after heat, chemical, pressure, and electrical stimuli, all consistent with features of central sensitization.⁶
- While much research has been done on SGB for PTSD and chronic pain (specifically CRPS), there have been no case reports in its use for chronic low back pain and for its use of both PTSD and pain in a single patient.
- The SGB was used for PTSD and chronic low back pain in an additional 2 patients. While both were eventually lost to follow up, both patients showed marked improvement of LBP immediately after the procedure (>70% decrease). One patient improved from a preprocedural score of 10, to 6 on 1-day post procedure, and to 0 on 1-week post procedure. Additionally, PTSD symptoms improved from severe/markedly elevated to moderate/threshold.
- SGB may be an appropriate therapy for concomitant PTSD and overlapping pain syndromes, including low back pain, related to central sensitization (Fig.2).

References

- Deng JJ, Zhang CL, Liu DW, Huang T, Xu J, Liu QY, Zhang YN. Treatment of stellate ganglion block in diseases: Its role and application prospect. *World J Clin Cases*. 2023 Apr 6;11(10):2160-2167. doi: 10.12998/wjcc.v11.i10.2160. PMID: 37122525; PMCID: PMC10131013.
- Kirkpatrick K, Khan MH, Deng Y, Shah KB. A Review of Stellate Ganglion Block as an Adjunctive Treatment Modality. *Cureus*. 2023 Feb 19;15(2):e35174. doi: 10.7759/cureus.35174. PMID: 36949968; PMCID: PMC10029323.
- Salter, Michael W., & Woolf, C. J. (2005). Cellular and molecular mechanisms of central sensitization. *The Neurobiology of Pain*, 95–114. <https://doi.org/10.1093/acprof:oso/9780198515616.003.0004>
- Lipov, E., Ritchie, E.C. A Review of the Use of Stellate Ganglion Block in the Treatment of PTSD. *Curr Psychiatry Rep* 17, 63 (2015). <https://doi.org/10.1007/s11920-015-0599-4>
- Eugene G. Lipov, Jaydeep R. Joshi, Sarah Sanders, Konstantin V. Slavin, A unifying theory linking the prolonged efficacy of the stellate ganglion block for the treatment of chronic regional pain syndrome (CRPS), hot flashes, and posttraumatic stress disorder (PTSD), *Medical Hypotheses*, Volume 72, Issue 6, 2009, Pages 657-661, ISSN 0306-9877, <https://doi.org/10.1016/j.mehy.2009.01.009>.
- Staud, R. Evidence for Shared Pain Mechanisms in Osteoarthritis, Low Back Pain, and Fibromyalgia. *Curr Rheumatol Rep* 13, 513–520 (2011). <https://doi.org/10.1007/s11926-011-0206-6>

Pre-Procedure		1 Day Post Procedure		1 Week Post Procedure		6 Weeks Post Procedure	
Pain	PTSD	Pain	PTSD	Pain	PTSD	Pain	PTSD
Neck/arm: 8	Severe / Markedly elevated	Neck/arm: 0	Mild / Sub-threshold	Neck/arm: 5	Mild / Sub-threshold	Neck/arm: 5	Moderate/ Threshold
Back: 8		Back: 0		Back: 4		Back: 6	

Table 1. Pain scores using the numerical pain score and PTSD symptomatology scored using CAPS-5 for all three patients pre-procedure, one day post procedure, one week post procedure, and six weeks post procedure.