

Complex Regional Pain Syndrome Refractory to Neuromodulation Managed by Lumbar Sympathetic Nerve Blocks and Ketamine Infusions

Carol Girgiss M.D., Gene Lee, M.D.
Cedars Sinai Medical Center, Los Angeles, CA



Background:

- **Complex Regional Pain Syndrome (CRPS):** disproportionate limb pain, autonomic dysfunction, and neuroinflammation.
- Commonly follows trauma or surgery.
- Affects ~1.2% of adults with chronic pain, predominantly women.
- **Clinical challenge:** Severe disability; unclear pathophysiology; variable presentation.
- **Treatment landscape:** No FDA-approved therapy — management is individualized.
- Sympathetic nerve blocks and ketamine show benefit in refractory CRPS.

Methods:

- Bilateral **lumbar sympathetic nerve blocks (LSNB)** performed over 9 years.
- **Technique:** Levels: L2 or L3, with fluoroscopy via a paramedian anterolateral approach.
- Needle: 25-gauge, 4.69-inch Quincke spinal needle.
- Injected: 8–10 mL of 0.25% **bupivacaine, 50 mcg fentanyl, and 5 mg dexamethasone** per side

Case:

- 79-year-old woman with bilateral lower extremity CRPS following multiple foot surgeries (2016).
- **Pharmacologic:** Partial relief with gabapentin 400–800 mg BID; limited benefit or intolerance to nortriptyline, pregabalin, duloxetine, topiramate, calcitonin, oxycodone, and topical agents
- **Neuromodulation:** Peripheral nerve stimulator trial, two Boston Scientific spinal cord stimulators (SCS) implanted (2020) with Transient 40–50% relief; explanted (2022) after failed revision.
- **Ketamine:** Weekly IV infusions (360 mg/session) → 2–3 days of partial relief, oral ketamine (40 mg) and CBD → modest benefit.
- **Bilateral LSNB** every 2–4 weeks with bupivacaine, fentanyl, and dexamethasone → most effective
- Consistent pain and functional improvement reported with ketamine and LSNB treatment plan.

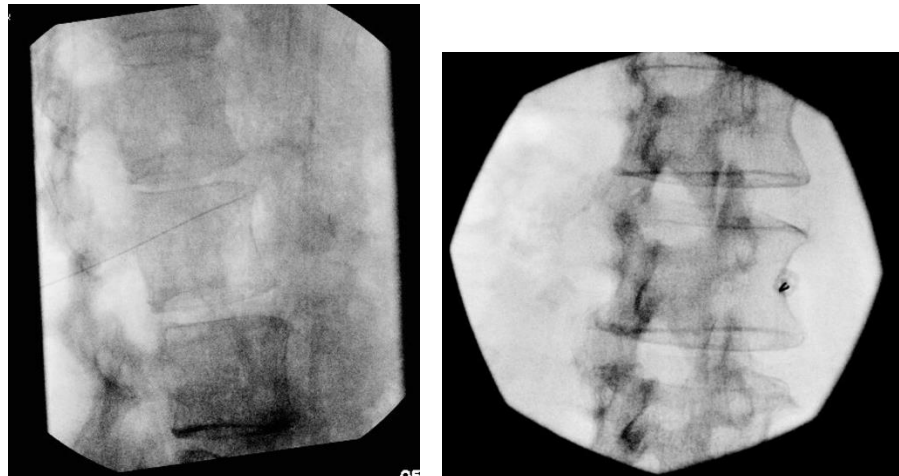


Figure 1. Lumbar sympathetic nerve block at L3 in lateral (left) and oblique (right) views

Conclusion:

- **Ketamine:** May reduce cortical hyperexcitability; outcomes vary by protocol.
- **LSNB:** Consistent pain and functional improvement in refractory CRPS.
- **Neuromodulation:** Can fail to provide durable benefit, often requiring explantation.
- CRPS complexity highlights importance of **individualized, multimodal therapy**.
- Future direction: Need for **biomarkers and optimized protocols** to predict treatment response.

References:

1. Zhao, J., Wang, Y., & Wang, D. (2018). The Effect of Ketamine Infusion in the Treatment of Complex Regional Pain Syndrome: a Systemic Review and Meta-analysis. *Current pain and headache reports*, 22(2), 12. <https://doi.org/10.1007/s11916-018-0664-x>
2. Lii, T. R., & Singh, V. (2023). Ketamine for Complex Regional Pain Syndrome: A Narrative Review Highlighting Dosing Practices and Treatment Response. *Anesthesiology clinics*, 41(2), 357–369. <https://doi.org/10.1016/j.anclin.2023.03.005>
3. Cheng, J., Salmasi, V., You, J., Grille, M., Yang, D., Mascha, E. J., Cheng, O. T., Zhao, F., & Rosenquist, R. W. (2019). Outcomes of Sympathetic Blocks in the Management of Complex Regional Pain Syndrome: A Retrospective Cohort Study. *Anesthesiology*, 131(4), 883–893. <https://doi.org/10.1097/ALN.0000000000002899>
4. Alebouyeh, M. R., Morsali, S. F., Zojaji, F., Ebrahimi, S. A., Ahani, A., & Antar, A. (2023). Refractory Complex Regional Pain Syndrome: A Case Report and Review of Literature. *Anesthesiology and pain medicine*, 13(4), e135286. <https://doi.org/10.5812/aapm-135286>
5. Limerick, G., Christo, D. K., Tram, J., Moheimani, R., Manor, J., Chakravarthy, K., Karri, J., & Christo, P. J. (2023). Complex Regional Pain Syndrome: Evidence-Based Advances in Concepts and Treatments. *Current pain and headache reports*, 27(9), 269–298. <https://doi.org/10.1007/s11916-023-01130-5>