

SPHENOPALATINE GANGLION BLOCK WITH LIDOCAINE DROPS RELIEVES LOWER EXTREMITY COMPLEX REGIONAL PAIN SYNDROME: A CASE REPORT

Danielle Levin, MD, Martin Acquadro, MD, DMD, Peter Assaad, DO, Mahmoud Al Masry, MD,
and Frederic Geroges, MD

Background: Lower extremity complex regional pain syndrome (CRPS) is a debilitating, neuropathic pain disorder that may develop into a refractory, chronic condition, which currently has no gold-standard treatment. We would like to share the first report of a transnasal sphenopalatine ganglion block with lidocaine that effectively relieved the pain of a patient suffering from lower extremity CRPS.

Case Report: A 48-year-old man with CRPS suffered from pain that was resistant to analgesic medications, spinal blocks, and a spinal cord stimulator. A sphenopalatine ganglion block was administered to the patient via long, hollow cotton-tip applicators with lidocaine drops. After just one block, for the first time in 10 years, he was 100% pain free for 5 days.

Conclusions: This case report demonstrates that the lidocaine sphenopalatine ganglion block could be a simple, safe, inexpensive, and noninvasive treatment option for those affected by lower extremity CRPS.

Key words: Sphenopalatine ganglion block, lidocaine, chronic pain, complex regional pain syndrome

BACKGROUND

Complex regional pain syndrome (CRPS) is a debilitating neuropathic pain disorder that is often difficult to treat. Various pharmacological medications, spinal blocks, intravenous lidocaine infusions, physical therapy, and spinal cord stimulators have been utilized, but effectiveness is not guaranteed. Currently, no gold standard therapy exists (1).

The purpose of this case report is to expand the knowledge regarding the use of the sphenopalatine ganglion block and suggest a new way of treating lower extremity CRPS.

We report the first case of a transnasal sphenopalatine ganglion block with lidocaine drops that provided 5 days of 100% pain relief for a patient suffering from lower extremity CRPS.

CASE PRESENTATION

A 48-year-old man with hypertension and sleep apnea suffered a work-related accident that led to right ankle reconstruction surgery approximately 10 years prior. Since then, this individual had been experiencing hair loss, discoloration, edema, and allodynia in his right foot.

He described the pain as moderate to severe in intensity, causing functional limitation in his life with significant interference with his ability to do activities of daily living, including household chores, yard work, and shopping, as well as affecting his sleep and mood. His symptoms were consistent with the Budapest criteria for CRPS. Through the years, the patient had been managed with a multidisciplinary regimen consisting of

From: Department of Anesthesiology, Critical Care & Pain Medicine, St. Elizabeth's Medical Center, Boston, MA

Corresponding Author: Danielle Levin, MD, E-mail: DanielleLevinMD@gmail.com

Disclaimer: There was no external funding in the preparation of this manuscript.

Conflict of interest: Each author certifies that he or she, or a member of his or her immediate family, has no commercial association (i.e., consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted manuscript.

Patient consent for publication: Consent obtained directly from patient(s).

Authors adhere to the CARE Guidelines for writing case reports and have provided the CARE Checklist to the journal editor.

Accepted: 2023-03-23, Published: 2023-05-31

spinal blocks, physical therapy, spinal cord stimulator, buprenorphine transdermal patches, gabapentin, oxcarbazepine, and monthly intravenous lidocaine infusions.

Unfortunately, with this treatment regimen, the patient was never pain free. After the intravenous lidocaine infusions, he would report partial pain relief, which would last at most 2-and-a-half weeks. Even though the intravenous lidocaine infusions were providing some relief, he was unable to continue receiving these infusions due to insurance difficulties.

Considering that the sphenopalatine ganglion block has previously been shown to relieve pain of various etiologies (2,3), we offered this treatment option to him. After discussing potential risks and benefits of the procedure, he elected to go ahead with the procedure and signed the written informed consent for a sphenopalatine ganglion block.

At the start of the treatment session, the patient reported a tingling/sensitive area underneath the medial malleolus of the right foot that radiated to the sole of his foot. He rated the pain as 5/10 on the Numeric Rating Scale (NRS-11), where 0 is no pain and 10 is the worst pain possible. For the procedure, the patient was supine with his chin up. Long, hollow cotton-tip applicators dipped into lidocaine ointment USP 5%, were placed atraumatically into both nasal sinuses (Fig. 1). They were advanced until gentle resistance was met at the back of the nasopharynx. Lidocaine 4% topical solution was dripped drop by drop through the hollow cotton-tip applicators into each nostril until the patient felt the medication in the back of his throat (Fig. 2). The cotton-tip applicators were left in place for 15 minutes, and then the patient was asked to sit up to evaluate his symptoms. After the first 15 minutes, the patient reported that his pain decreased to 4/10 on the NRS-11. The procedure was repeated a second time for another 15 minutes. When the patient sat up after the second 15 minutes, his pain was entirely gone.

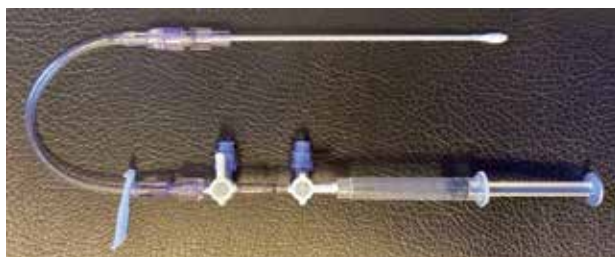


Fig. 1. Our transnasal sphenopalatine ganglion block cotton-tip applicator.

During the procedure, a total of 3.25 mL of lidocaine 4% topical solution was administered in the right nostril in divided doses, and a total of 1.75 mL of lidocaine 4% topical solution was administered in the left nostril in divided doses. The patient recovered for an additional 10 minutes before being discharged home. After the 10 minutes of observation, the patient again rated the pain as 0/10 on the NRS-11. He kept moving his right ankle around in disbelief, but the pain was not there. The patient had no adverse effects from the treatment.

The patient was followed up one month later. He reported that for the first time since his initial injury, he was 100% pain free for 5 days post the sphenopalatine ganglion block. The patient's right foot pain started to gradually return after the 5 days, but he felt that the pain that returned was significantly less than his original pain. When asked whether he had any other effects from the treatment, the patient reported that since the sphenopalatine ganglion block, his arthritic knee pain also significantly improved.

DISCUSSION

CRPS was first described in 1851 by Claude Bernard as a condition involving sympathetic nervous system dysfunction. Approximately 7% of patients with limb fractures, limb surgery, or other limb injuries develop this condition, characterized by continuing pain that is disproportionate to the usual course of any known lesion/trauma. The pain is regional, not dermatomal, and shows variable progression over time (4).

Multiple central and peripheral mechanisms seem to be involved in CRPS. It is theorized that the pathophysiology of this condition involves autonomic changes, peripheral and central sensitization, sympatho-afferent coupling, brain changes, genetic and psychological factors, and inflammatory and immune alterations.



Fig. 2. The patient receiving the transnasal sphenopalatine ganglion block via the cotton-tip applicators. Verbal and written informed consent was provided by the patient for publication of this image.

For many people, this condition resolves within the first year, but it is unknown why, for a small subset of individuals, their condition progresses to a chronic form.

Pain symptoms are transmitted through the sympathetic nervous system; it appears that all the sympathetic neurons are interconnected in the body (5). This suggests that if a portion of the sympathetic nervous system is blocked, pain might be relieved in other parts of the body as well.

The sympathetic nervous system is located deep inside the body, so it is typically difficult to access it; however, the sphenopalatine ganglion is the one exception. The sphenopalatine ganglion is almost exposed to the outside world via the nose because it is covered by just one to 2 mm of connective tissue and mucous membrane (6). In other words, through blocking the sphenopalatine ganglion, a patient may experience pain relief in other parts of the body through descending inhibition of nociceptive transmission in the spinal cord.

Quevedo et al (7) published a report of 2 cases where a sphenopalatine ganglion block with 4% tetracaine provided temporary, partial relief to patients afflicted with lower extremity CRPS. Considering that in our practice, we have witnessed patients experience 100% pain relief with our sphenopalatine ganglion block lidocaine apparatus for various painful conditions, so we offered this treatment to our patient. For the first time in 10 years, after the lidocaine sphenopalatine ganglion block, our patient was able to walk out of

our pain clinic completely pain free and continued to be 100% pain free for 5 days.

There are several commercially available devices available to perform sphenopalatine ganglion blocks, but the administration of this block via the use of our sphenopalatine ganglion block lidocaine apparatus makes this treatment simple and inexpensive (3). The fascinating aspect of this block is that not only does it treat numerous pain conditions, including headaches of various etiologies, neck pain, back pain, postoperative shoulder pain, chronic abdominal wall pain, and now lower extremity CRPS, but it also, somehow, provides a long-term effect (2,3,8,9). Even after the temporary effects of the local anesthetic wear off, some patients continue to experience pain relief. This is an incredible phenomenon that would benefit from further research.

CONCLUSIONS

CRPS is often difficult to manage with physical/occupational therapy, analgesic medications, intravenous infusions, and other invasive procedures. This case report demonstrates that a lidocaine sphenopalatine ganglion block could be a simple, safe, inexpensive, and noninvasive treatment option for those affected by lower extremity CRPS.

Acknowledgments

We want to thank all the great health care professionals involved in the care of this patient.

REFERENCES

1. Chung OY, Bruehl SP. Complex regional pain syndrome. *Curr Treat Options Neural* 2003; 5:499–511.
2. Levin D, Cohen S. Images in anesthesiology: Three safe, simple, and inexpensive methods to administer the sphenopalatine ganglion block. *Reg Anesth Pain Med* 2020; 45:880–882.
3. Grant GJ, Echevarria GC, Lax J, Pass HI, Oshinsky ML. Sphenopalatine ganglion block to treat shoulder tip pain after thoracic surgery: Report of 2 cases. *A&A Practice* 2018; 11:90–92.
4. Bruehl S. Complex regional pain syndrome. *BMJ*. 2015; 351:h2730.
5. Schlereth T, Birklein F. The sympathetic nervous system and pain. *Neuromolecular Med* 2007; 10:141–147.
6. Robbins MS, Robertson CE, Kaplan E, et al. The sphenopalatine ganglion: Anatomy, pathophysiology, and therapeutic targeting in headache. *Headache* 2015; 56:240–258.
7. Quevedo JP, Purgavie K, Platt H, Strax TE. Complex regional pain syndrome involving the lower extremity: A report of 2 cases of Sphenopalatine Block as a treatment option. *Arch Phys Med Rehabil* 2005; 86:335–337.
8. Cohen S, Levin D, Mellender S, et al. Topical sphenopalatine ganglion block compared with epidural blood patch for postdural puncture headache management in postpartum patients. *Reg Anesth Pain Med* 2018; 43:880–884.
9. Levin D, Acquadro M, Assaad P, Eelani C, Al-Masry M, Gerges F. Sphenopalatine ganglion block relieves chronic abdominal wall pain! [Internet]. *Surgical Case Reports*. Science Repository OU; 2022. www.sciencerepository.org/sphenopalatine-ganglion-block-relieves_SCR-2022-11-103

PRESENTATIONS AT MEETINGS

1. Moderated (Oral) Presentation at the 76th Annual Post Graduate Assembly in Anesthesiology that took place in December 2022, New York, NY
2. Poster presentation at the International Anesthesia Research Society 2022 Meeting that took place in March 2022, Virtual Meeting. Abstract published: https://meetings.iars.org/wp-content/uploads/2022/06/Final22_IARS-SOCCA-Med-Cases.pdf (pages 283 - 284).
3. Poster presentation at the Society of Critical Care Anesthesiologists 2022 Annual Meeting that took place in March 2022, Virtual Meeting. Abstract published: https://meetings.iars.org/wp-content/uploads/2022/06/Final22_IARS-SOCCA-Med-Cases.pdf (pages 283 - 284).
4. Poster presentation at the 47th Annual Regional Anesthesiology & Acute Pain Medicine Meeting that took place in March 2022, Las Vegas, Nevada. Abstract published: <https://asraonline.egnyte.com/fl/csR60SVKIk#folder-link/RA22%20Abstract%20PDFs?p=dafbe61a-acd8-45a3-9a47-0ef712ea502f>.