

INTRACTABLE HICCUPS TREATED WITH STELLATE GANGLION BLOCK: CASE REPORT

Danielle Levin, MD, Jonathan Alabre, MD, and Ryan Gualtier, MD

Background: A hiccup is a common well-documented physiologic process that occurs due to a sudden involuntary contraction of the diaphragm and intercostal muscles, with subsequent rapid closure of the glottis. While acute hiccups, lasting < 48 hours, are experienced by almost all individuals at some point in their life, prolonged hiccups lasting > 48 hours, or intractable hiccups lasting > 1 month, are quite rare and may significantly impact a person's quality of life. We would like to share a report of a stellate ganglion (SG) block relieving the discomfort of a patient suffering from idiopathic intractable hiccups.

Case Report A 73-year-old man suffered from > 3 years of idiopathic intractable hiccups that were resistant to oral medications and phrenic nerve blocks. An ultrasound-guided SG block with a combination of ropivacaine and lidocaine was administered to the patient. After this block, for the first time in over 3 years, the patient was 100% hiccup-free for one week.

Conclusions: This case report demonstrates that the ultrasound-guided SG block could be a temporary treatment option for those affected by idiopathic intractable hiccups.

Key words: Stellate ganglion block, ultrasound, intractable hiccups, local anesthetic

BACKGROUND

Intractable hiccups is a debilitating disorder that is quite rare and often difficult to treat. Various pharmacological and nonpharmacological treatments, as well as nerve blocks, are available, but effectiveness is not guaranteed. Currently, no gold standard therapy exists.

The purpose of this case report is to expand the knowledge of intractable hiccups and discuss stellate ganglion (SG) block as a possible treatment option for this condition.

We report a case of an SG block providing one week of 100% relief of hiccups to a patient with intractable hiccups, resistant to pharmacological treatments and phrenic nerve blocks.

CASE PRESENTATION

A 73-year-old man with a past medical history of hypertension and hyperlipidemia developed intrac-

table hiccups 3 years prior to presentation to our pain management clinic. For the last 3 years, the patient had been experiencing hiccups about 50% of the days. During this time, he occasionally has had up to 3 days without hiccups, but when the hiccups were present, they happened continuously, every 3 to 5 seconds. When the hiccups occur, the patient is unable to tolerate food, which has resulted in the patient losing a considerable amount of weight. When the patient is sleeping, however, the hiccups resolve.

In an attempt to manage these hiccups, the patient at first tried metoclopramide, with no relief. Then, treatment with clonazepam and promethazine resulted in a modest response; unfortunately, though, the patient suffered an episode of asystole, followed by treatment in the Intensive Care Unit, which interrupted the treatment. His intractable hiccups returned after the

From: Anesthesiology, Critical Care & Pain Medicine, New York University, New York, NY

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

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Intensive Care Unit stay, and he was then trialed on a combination of baclofen, clonazepam, and chlorpromazine. This combination of medications provided the patient no relief. Chlorpromazine was then replaced by olanzapine, but, unfortunately, no relief came from that as well. Desperate to find some type of solution, the patient traveled to England for a trial of a phrenic nerve block. The patient had a left phrenic nerve block the first day, followed by a right phrenic nerve block the following day, but that too, resulted in no improvement.

At our pain management clinic, we offered the patient a trial of a right-sided SG block under ultrasound guidance. After discussing the risks and benefits of this procedure, the patient provided verbal and written informed consent to undergo this block. On the day of the procedure, the patient was experiencing the intractable hiccups.

The patient was placed in the supine position with his neck turned to the left. The right neck was prepped and draped in a sterile fashion and sterile technique was adhered to throughout the entire procedure. The ultrasound transducer was placed perpendicular to the tracheal axis at the cricoid cartilage and moved inferiorly until the superior aspect of the thyroid gland was visualized. Next, the transducer was relocated laterally to visualize the anterior aspect of the Chassaignac's tubercle on the C6 transverse process. The carotid artery, internal jugular vein, thyroid gland, trachea, longus colli and longus capitis muscles, prevertebral fascia, the root of C6 spinal nerve, and transverse process of C6 were all identified. Color Doppler was utilized to detect the position of the vessels. With an in-plane approach, the 22G 2-inch Pajunk needle was placed beside the trachea with a lateral-to-medial direction. The tip was advanced to the prevertebral fascia of the longus colli muscle located between the posterior aspect of the carotid artery and the tip of the C6 anterior tubercle. After negative aspiration, the injectate (consisting of 3 mL of 0.5% ropivacaine with 3 mL of 1% lidocaine) was administered, and spread was visualized in real time.

The needle was removed, the patient's neck was washed, dried, and dressing was applied. Patient tolerated the procedure well without complications. He remained stable and ambulated to the recovery area without difficulty. For the remainder of that day, the patient continued to have hiccups, but the interval of time in between the hiccups was significantly greater than before. Twenty-four hours after the procedure, the patient's hiccups stopped. He had no hiccups for one

week. Unfortunately, the patient's hiccups did return one week later, again preventing the patient from eating and speaking in full sentences.

One month after the initial SG block, the patient had a second SG block. The block was performed in the same manner, but this time, the injectate consisted of 8 mL 0.25% ropivacaine. The patient experienced no swelling, redness, fever, weakness, numbness, or discharge from either of the 2 procedures. Unfortunately, this time the block did not provide the patient any relief. The patient continues to suffer from intractable hiccups.

DISCUSSION

A hiccup is a well-documented physiologic process that occurs due to a sudden involuntary contraction of the diaphragm and intercostal muscles, with subsequent rapid closure of the glottis. The resultant "hic" sound is produced, for which the phenomena is believed to have gotten its name. While the exact underlying mechanism of a hiccup is actively being researched, there are some well-established theories regarding its pathophysiology.

The current field of thought suggests that insult, disturbance, or irritation at any point along the "hiccup reflex arc" pathway, can result in the generation of a hiccup (1). The "reflex arc" is comprised 3 major components: (1) an afferent limb, consisting of the vagus nerve, phrenic nerve, and sympathetic chain; (2) a poorly defined central processor, believed to include the medulla oblongata, hypothalamus, and other possible structures; as well as (3) an efferent limb created by the phrenic nerve and accessory nerve motor fibers (1,2).

While acute hiccups, lasting < 48 hours, are experienced by almost all individuals at some point in their life, prolonged hiccups lasting > 48 hours, or intractable hiccups lasting > 1 month, have an unknown prevalence in the general population. However, there are certain pathologic states that have been shown to have an increased association with development of prolonged hiccups (3). These pathologies include, but are not limited to, central nervous system disorder (postvascular accident, encephalopathy, infection), metabolic dysregulation (uremia, electrolyte imbalance, hypocapnia), advanced malignancy, vagus and phrenic nerve irritation in setting of postoperative state (intraabdominal and/or intrathoracic surgery), medication side effect (such as dexamethasone induced), and states of psychologic stress or excitement (2,3).

Though acute hiccups are typically benign and relatively well tolerated, intractable hiccups are known to

have a significant negative influence on the quality of life of those experiencing them. The frequent and persistent nature of this condition often interferes with patients' sleep, ability to eat, socialize, or rest (4). In some cases, this can result in malnutrition, insomnia, dehydration, and anxiety.

Efforts to restore adequate quality of life to patients suffering from prolonged or intractable hiccups have led to the development of pharmacologic and interventional treatment pathways.

The initial course of action for acute and prolonged/refractory hiccups is to trial the use of physical maneuvers to disrupt the hiccup cycle. Patients may be encouraged to "breath-hold," perform Valsalva maneuver, and suction with excessive force (5). Though data is limited regarding the efficacy of these practices, anecdotal reporting has shown consistent success rates, especially for patients in an acute hiccup bout. If the episode continues beyond 48 hours, it is recommended to evaluate the etiology of the hiccups to assess if there's an acute reversible cause. If an identifiable source cannot be found, initiation of pharmacotherapy is then indicated.

The proposed pharmacologic algorithm for management of prolonged hiccups suggests that if at any stage of treatment, the patient has resolution of symptoms, the medication should then be discontinued the following day. The first-line agent recommended is a proton pump inhibitor (PPI) for a trial of 3-4 weeks. If refractory to the PPI, the subsequent steps are 10 to 15-day trials of baclofen or gabapentin, then metoclopramide, then chlorpromazine (6). While additional agents could be trialed if a patient fails the initial treatment pathway, it is appropriate at that point to offer interventional treatment for symptom management. Few case reports worldwide have shown promising early-stage data that interventional manipulation of the phrenic nerve and diaphragm may result in complete resolution of refractory hiccups.

The SG nerve block has been studied as a potential option for patients who did not respond to pharmacologic therapy. The ganglion itself is a collection of nerves formed by the convergence of the inferior cervical ganglion and the first thoracic ganglion, both sympathetic ganglia. It is located lateral to the C7 and T1 vertebral bodies, along the longus colli muscle. Classic indications for performing this block are to treat conditions influenced or generated by the sympathetic outflow of the SG, such as complex regional pain syndrome, headache, and others. The thought behind using this nerve block to treat intractable hiccups is that the SG, as part of the sympathetic chain, serves as a component of the "reflex arc" that is postulated to be the pathway for which hiccups are generated (3). By temporarily disrupting the pathway, the cycle of hiccups generated can be interrupted with the goal of prolonged resolution or complete remission. Though this practice is still in its early stages, the hope is that one day the SG nerve block can serve as a definitive treatment for patients with intractable hiccups.

CONCLUSIONS

Idiopathic intractable hiccups is often difficult to manage with medications and invasive procedures. This case report demonstrates an SG block could be a treatment option for those affected by idiopathic intractable hiccups. However, further research is necessary to establish long-term resolutions to this pathology.

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