Case Report : Phrenic Nerve Block for the treatment of Intractable Hiccups

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Introduction

- Singultus or more commonly known as hiccups are repeated, involuntary contractions of the diaphragm. Hiccups are caused by gastric distension usually from ingestion of food/carbonated beverages or from central nervous system lesions, gastrointestinal disorders (especially gastroesophageal reflux disease, gastritis, and peptic ulcer disease). Intractable hiccups are those that persistent for greater than one month. Though relatively uncommon they can lead to serious detriments in the quality of ones life (ie insomnia/sleep deprivation, weight loss, fatigue/exhaustion, and depression).
- The hiccup reflex arc consists of three components: (1) an afferent limb (vagal, phrenic, and sympathetic nerves) that transmits stimuli to (2) a central processing unit in the medulla and cervical spine (C3-C5), modulated by neurotransmitters including dopamine, GABA, and serotonin, which then activates (3) an efferent limb via the phrenic nerve to the diaphragm and accessory nerves to intercostal muscles.
- 1st line Pharmacological interventions include Baclofen and Gabapentinoids followed by metoclopramide
- Non Pharmacological treatment options include physical maneuvers, acupuncture, ultrasound-guided phrenic nerve block and diaphragmatic pacing
- The literature does not provide clear guidance on which side to block first when performing unilateral block. The decision appears to be individualized based on: clinical assessment of which hemidiaphragm is predominantly involved and underlying etiology (e.g., left-sided for esophageal pathology)

Methods

As the case report is devoid of patient identifiable information, it is exempt from IRB review requirements as per Ochsner's policy. Patient informed consent was obtained for this case report to be presented.

Case Report

- A 40-year-old male presented in August 2024 with a 2-year history of intractable hiccups causing diaphragmatic soreness, frequent belching, and impaired sleep. Temporary relief was achieved with self-induced gagging. Prior interventions included Nissen fundoplication (with subsequent takedown), endoscopies, and unsuccessful trials of gabapentin, chlorpromazine, and muscle relaxants. At follow-up in January 2026, he reported progressive dyspnea on exertion and 20-pound weight loss. A left phrenic nerve block was performed using dexamethasone 10 mg and 2% lidocaine, with concurrent gabapentin 400 mg TID. At two-week follow-up, the patient achieved near-complete symptom resolution with improved appetite and quality of life.

Figures



Management of intractable hiccups may require individualized combinations of pharmacologic and interventional therapies to optimize patient outcomes.

Discussion

This case demonstrates the importance of considering both pharmacological and non pharmacological interventions with timely treatment with respect to intractable hiccups.

- The patient experienced intractable hiccups for a period of over 4 years that negatively affected his quality of life. .
- The patient's description of temporary cessation from self induced gagging demonstrates an intriguing aspect of the presentation. Self-induced gagging terminates hiccups by stimulating the vagus nerve, which interrupts the hiccup reflex arc. Vagal maneuvers work by temporarily modulating afferent input to the central processing unit, but the entire arc including the "hiccup center" in the medulla remains functional and susceptible to re-activation. Hence only temporary cessation of the hiccups.
- Our patient reported temporary/minimal relief from pharmacological treatment in the past. Specifically, antispasmodics' provided the patient with no relief. However, the combination of phrenic nerve block and gabapentinoids, the patient reported near termination of his hiccups.
- Given lack of relief from antispasmodics, the pathology may likely be at the motor neuron level as opposed to the muscle itself. Inflammation of the brain and spinal cord can worsen hiccups due to nerve irritation. Patient was seen by neurology who ordered an MRI of the Brain which was not obtained
- Prior case reports have varying interventions when it comes to intractable hiccups. To date, none have proven to be more superior to the another. Adequate treatment may come down to individualization and combination of both pharmacological and nonpharmacological measures to improve quality of life
- The collective evidence from these case reports and studies underscores the need for timely recognition and appropriate management to improve patient outcomes.

References

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