

Primary Cough Headache Responded to Ultrasound Guided Greater Occipital Nerve Block: A Case Report

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ABSTRACT

Introduction: Primary Cough Headache (PCH) is a rare type of headache and needs to be evaluated after exclusion of secondary reasons. There are limited number of case reports in the literature about treatment modalities.

Case: Herein, we report that a 42-year-old female patient with PCH who could not use the oral medication because of side effects. When she came to the pain clinic with an attack with intensity of 9/10, we took her to the local operating room. The ultrasound (US) guided proximal greater occipital nerve block with bupivacaine was performed and the intensity

of the attack was reduced to 2/10. The blockage was repeated once a week for a month. After two months, both the intensity of headache and number of attacks decreased and no adverse effect was observed.

Conclusion: PCH is a challenge for physicians because of the severity of attacks and difficulty in ruling out secondary causes at the time of diagnosis. The US-guided PGONB can be performed in the emergency department for the PCH when medical treatment fails.

Keywords: cough headache, GONB, PCH, proximal greater occipital nerve block, ultrasound

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INTRODUCTION

Cough-induced headaches are uncommon, and the majority of cases have underlying pathologies such as Chiari type 1 malformation, posterior fossa lesions, cerebral aneurysms, obstructive hydrocephalus, and spontaneously low cerebrospinal fluid (CSF) pressure. Cough headaches require neuroimaging. It is possible to diagnose primary cough headache (PCH) once other causes are ruled out (1,2).

In the absence of an intracranial condition, the International Headache Society (IHS) defines PCH as at least two episodes of abrupt onset headache lasting between one second and two hours that occur “only in association with coughing, straining, and/or other Valsalva maneuver” (3). Between the ages of 40 and 81, PCH affects everyone, with women being more likely to be affected (2). A cough headache typically lasts a few minutes to a few seconds, although it can last up to two hours in some circumstances. It typically begins abruptly and is bilateral in distribution (4–6). Precipitants include sneezing, coughing, nose blowing, laughing, sobbing, singing, lifting (including weightlifting), leaning over, and straining at stools. Primary cough headaches are not precipitated by prolonged physical exercise (4–6). These headaches respond to indomethacin and are not accompanied by nausea, vomiting, light or sound sensitivity, conjunctival injection, rhinorrhea, or lacrimation. Topiramate, methysergide, propranolol, naproxen, and intravenous metoclopramide have also been shown beneficial in addition to indomethacin (5,6).

Highlights

- PCH is challenging for a physician to diagnose and also to treat.
- US guided PGONB can be a treatment method for PCH.
- PGONB may have worked by affecting the central neuromodulatory pathways of PCH.

Here, we present a 42-year-old female patient who came to the pain clinic with PCH and responded to an ultrasound (US)-guided proximal greater occipital nerve block (PGONB).

CASE

Verbal and written informed consent was obtained from the patient.

The patient was a 42-year-old woman with a history of menstrual migraine, Hashimoto Thyroiditis, Familial Mediterranean Fever (FMF), and dyspepsia. She was taking 75 mg of levothyroxine, 30 mg of lansoprazole, and 1.5 mg of colchicine daily. In February of 2023, she was diagnosed with acute bronchitis, which was treated with antibiotics and bronchodilators.

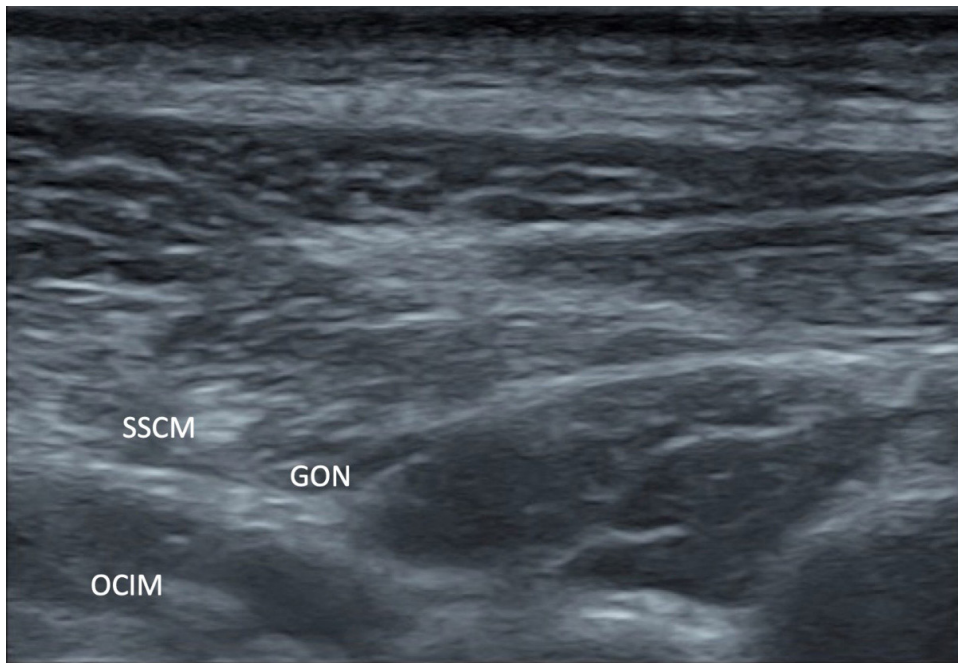


Figure 1. Sonoanatomy of the intervention. Proximal (at C2 level) Greater Occipital Nerve (GON), Semispinalis capitis muscle (SSCM), Obliquus capitis inferior muscle (OCIM).

She developed a daily headache after two weeks, manifesting as more than ten short-lasting attacks per day provoked by coughing, straining, and lifting. The duration of each attack was 30 minutes, and the pain was bilaterally distributed from the neck to the top of the head. The headache was sharp and severe. She described the attack as a sensation of storm-like fluid movement in the head. She did not suffer any of the symptoms associated with previous migraine attacks, such as phonophobia, photophobia, vomiting, or throbbing. The severity of the attack was determined using a numeric rating scale (NRS) with a score of 9 out of 10. These attacks typically necessitated a visit to the emergency room. The results of her physical and neurological exams were unremarkable. The laboratory tests, including those for thyroid hormones, electrolytes, liver and kidney function, and serology, were negative. Brain and cervical spinal magnetic resonance imaging (MRI) with and without contrast, magnetic resonance venography (MRV), and angiography (MRA) were all normal. She did not give consent for a lumbar puncture. When we first encountered her in the clinic, she was taking 25 mg of indomethacin per day. Her attacks stopped after putting her on 60 mg of lansoprazole and increasing her daily dose of indomethacin to 150 mg. However, she encountered gastrointestinal side effects, so the indomethacin was discontinued on day three. Due to the adverse effects, she was unable to take topiramate and propranolol.

She came to the clinic 15 days after her initial visit with an NRS score of 9/10. She was taken to the local operating room. We used a GE Healthcare, Voluson™ E6, ultrasonography system with a linear 13–5 MHz probe for unilateral PGONB. The patient's neck was prone to flexion. The linear probe was initially transversely positioned on the occipital protuberance and then advanced caudally, demonstrating that the C2 spinous process resembled the two horns. Through lateral probe movement, the inferior muscles of the obliquus capitis and semispinalis capitis were located. Here, the superior to the inferior oblique capitis muscle and beneath the semispinalis capitis muscle were identified to be the greater occipital neuron (GON) (Figure 1). From this location, a 22-gauge spinal needle and 3 ccs of bupivacaine at a concentration of 0.5% were used to perform GON blocking. The intensity of her attack decreased from 9/10 to 2/10 after the first 20 minutes of the block. Throughout a month, the blocks were repeated once a week. In the second month, the frequency of her attacks decreased to two per

month, with an intensity of 4/10. She did not encounter any attacks in the sixth month.

DISCUSSION

To the best of our knowledge, this is the first case of PCH treated with US-guided PGONB. Several studies on the efficacy of GON block for primary headaches have been conducted. US-guided nerve blocks appear to be relatively safe, efficient, and simple to administer (7). Compared to proximal (C2 level) and distal US-guided block approaches, C2-level blocks have a greater definitive block effect and longer-term efficacy (8). Based on our research, no literature exists regarding the effects of GONB in PCH. In this case, the GONB was found to be beneficial for relieving the patient and reducing the frequency and severity of attacks.

In the scientific literature (1), the pathophysiology of PCH is still a matter of debate. Coughing induces abrupt increases in intraabdominal and intrathoracic pressures that are transmitted through the venous system into the intracranial venous sinuses, activating perivascular or intradural nociceptive neurons (6), according to the most commonly held theory. The origin of the greater occipital nerve is the dorsal root of the second cervical nerve. Trigeminal and upper cervical nerves innervate the structures of the cranium, such as intradural and perivascular nociceptive neurons. The trigeminal nucleus caudalis (TNC) is located in close proximity to the upper cervical spinal cord. Upper cervical and trigeminal nerve sensory input appears to converge at the TNC. Greater occipital nerve blockade (GONB) interrupts the transmission of pain through occipital nerves to the TNC (7). Consequently, GONB may have a neuromodulatory influence on the central mechanism of the PCH.

Primary cough headache is difficult to diagnose and manage, making it a challenge for emergency medicine physicians and headache specialists. This is the first documented case of a patient who showed clinical improvement following repeated PGONB. The US-guided PGONB for PCH is safe and easy to perform. Having knowledge of PCH and providing effective treatment are necessary in order to improve the quality of life of the patients.

Informed Consent: Verbal and written informed consent was obtained from the patient.

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Conflict of Interest: The authors declared that there is no conflict of interest.

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