

General

Post Dural Puncture Headache After Spinal Cord Stimulator Lead Insertion Successfully Treated with Occipital Nerve Blocks

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Post-dural puncture headache (PDPH) is a common and debilitating complication that can arise after spinal or epidural anesthesia, or following the placement of spinal cord stimulation leads due to inadvertent dural puncture. We report the case of a 54-year-old female who developed severe PDPH following a spinal cord stimulator trial, complicated by a failed EBP performed by an outside physician. The patient presented to the emergency department with debilitating bilateral occipital headaches exacerbated by an upright position. Given the failure of the EBP, she was treated with bilateral occipital nerve blocks, which resulted in near-complete and rapid resolution of her symptoms. This case highlights the effectiveness of occipital nerve blocks as a therapeutic option for PDPH, especially in challenging cases where other treatments have proven inadequate. Given the positive outcome observed, occipital nerve blocks should be considered a viable treatment option in the management of PDPH, warranting further study to better understand its role in clinical practice.

INTRODUCTION

Post-dural puncture headache (PDPH) is a well-known complication that can occur after performing spinal or epidural anesthesia. Additionally, it can occur when placing percutaneous spinal cord stimulation leads with inadvertent dural puncture.^{1,2} PDPH is a position-dependent condition, where the headache worsens with standing and sitting upright and improves when lying flat.¹⁻⁴ The condition is often bilateral with throbbing pain in the occipital and frontal regions. PDPH can be quite debilitating and may last for days or even weeks, making it difficult to manage. The headache is believed to occur due to the loss of intracranial cerebrospinal fluid (CSF) through the dural tear. This loss of CSF leads to a reduction in intracranial pressure with a compensatory cerebral vasodilation response. Additionally, these changes lead to mechanical traction on sensitive neurological structures, further contributing to headache complaints when a patient is in the upright position.^{3,4}

Treatment options for PDPH may include a trial of conservative management, such as increased fluid intake and hydration, caffeine, and oral analgesics. If conservative options fail to alleviate symptoms, an epidural blood patch (EBP) is commonly performed. EBP is considered the gold standard for treating PDPH, as it has proven to give rapid and robust symptom resolution with minimal side effects.⁵⁻⁸ If EBP is unsuccessful or cannot be performed, there is small but growing evidence to support the use of

peripheral nerve blocks for the management of debilitating PDPH, including occipital nerve blocks and sphenopalatine ganglion blocks.⁹⁻¹¹

We discuss an interesting case of a 54-year-old female who presented to the emergency room with debilitating PDPH symptoms after a spinal cord stimulator trial and failed EBP by an outside pain management physician. The patient was successfully treated and discharged after bilateral occipital nerve blocks.

CASE PRESENTATION

The patient was a 54-year-old female with a history of chronic low back and leg pain related to persistent spinal pain after surgery. She reported a history of lumbar spinal fusion from L4 to her sacrum. She had ongoing back pain and radicular pain complaints down both legs, which did not respond to conservative medication and interventional therapies. The patient ultimately underwent a spinal cord stimulator trial at an outside facility, complicated by a dural puncture and post-dural puncture headache. She reported that she was evaluated by her pain management physician and was provided with an epidural blood patch, which was unsuccessful. The patient was then directed to the university hospital emergency room for further evaluation and management. She developed severe bilateral occipital headaches that were worse when sitting and standing and alleviated by lying flat. She was offered a trial of occipital

nerve blocks for her ongoing pain complaints, and the patient was agreeable and consented to the procedure.

The patient was placed in the prone position to avoid sitting her up and allow for patient comfort. The external occipital protuberance was palpated and identified. The area was cleaned with alcohol pads, followed by betadine solution. Next, a 25-gauge, 1.5-inch needle was advanced towards the occipital nerves at a 45-degree angle to the skin, aiming for the point where the nerves cross the superior nuchal line. Aspiration for blood or cerebrospinal fluid was negative, and 2 mL of local anesthetic and 20 mg of methylprednisolone acetate was injected around the occipital nerves on each side, and the needles withdrawn. The procedure was performed bilaterally without any complications. The goal of occipital nerve blocks is to block the transmission of pain signals from the occipital nerves, thereby reducing pain and discomfort. The patient reported near-complete resolution of her symptoms 10 minutes after the procedure. She was able to sit up comfortably in bed and ambulate without significant discomfort. She was discharged from the emergency room and instructed to follow up with her pain management physician for any further concerns.

DISCUSSION

Occipital nerve blocks have emerged as a promising treatment modality for patients suffering from PDPH, particularly in cases where conventional therapies like EBP are not able to be performed or have failed. The pathophysiology of PDPH is rooted in the loss of cerebrospinal fluid (CSF) following dural puncture, leading to decreased intracranial pressure and subsequent compensatory cerebral vasodilation. This physiological cascade results in the characteristic throbbing headache, exacerbated in an upright position and relieved by lying flat.¹⁻⁴ While EBP offers rapid relief by sealing the dural tear and restoring CSF pressure, it is not without limitations. Failures of EBP are not uncommon and can leave patients with prolonged and severe headaches.

In recent years, peripheral nerve blocks, particularly occipital nerve blocks, have gained attention as a viable alternative or adjunctive treatment for PDPH.^{12,13} The occipital nerve block targets the greater and lesser occipital nerves, which innervate the posterior scalp and are implicated in

headache pathophysiology. By blocking these nerves, the transmission of pain signals is disrupted, providing relief from the intense headache associated with PDPH.⁹⁻¹³ In our case, the use of bilateral occipital nerve blocks resulted in near-complete and rapid symptom resolution, allowing the patient to be discharged comfortably from the emergency room. This outcome underscores the efficacy of occipital nerve blocks not only as a primary treatment in refractory cases of PDPH but also as a rescue therapy following a failed EBP.

The success of occipital nerve blocks in this case aligns with the literature. However, it is important to note that while the procedure is generally safe, it is not without risks, such as infection, bleeding, or nerve injury, although these complications are rare. A thorough understanding of the relevant anatomy is essential to minimize the risk of unintended complications.

Moreover, the long-term efficacy of occipital nerve blocks for PDPH remains an area requiring further research. Current evidence primarily supports their short-term benefits, and more studies are needed to evaluate their role in the sustained management of PDPH.

CONCLUSION

This case report illustrates the potential of occipital nerve blocks as an effective treatment for PDPH, particularly in cases where conventional therapies like epidural blood patches fail. The rapid and sustained symptom relief observed in our patient highlights the utility of this procedure in clinical practice. While the existing literature supports the use of occipital nerve blocks, further research is warranted to fully establish their role in the long-term management of PDPH and to refine the indications for their use. As more data becomes available, occipital nerve blocks may become an increasingly important tool in the armamentarium of pain management specialists for the treatment of PDPH.

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