



Case Report

The Role of Transnasal Sphenopalatine Ganglion Block in Post-Dural Puncture Headache Management: A Case Series and Review

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Abstract

The Sphenopalatine Ganglion Block (SPGB) is a procedure that has been used successfully for several different types of headaches. It has also been shown to be an effective alternative to the epidural blood patch for treatment of Post-Dural Puncture Headache (PDPH), though evidence is limited. We describe a series of four cases where SPGB was integrated into our treatment for PDPH, each with varying results.

Background

Post-Dural Puncture Headache (PDPH) is a common complication associated with neuraxial anesthesia, particularly in the obstetric population. It can occur after either a spinal or epidural with an unintentional dural puncture. Dural punctures during epidural placement occur about 1.5% of the time in the obstetric population, and about 50% of those go on to develop a PDPH [1]. Multiple treatment modalities exist for PDPH, but in general the epidural blood patch is considered the gold standard treatment [2]. However, a blood patch is not without risks or discomfort. Back pain or a second accidental dural puncture can occur when performing the blood patch [3]. Because of the invasiveness and discomfort of an epidural blood patch, other treatment modalities for PDPH have been explored.

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A Sphenopalatine Ganglion Block (SPGB) is a procedure that has been well documented in the literature as a treatment for several types of headaches, most notably cluster headaches [4]. The block is commonly performed using intranasal application of a local anesthetic either with syringe nasal applicator or with a simple cotton-tip applicator soaked in local anesthetic. There has been recent literature showing the SPGB is a viable option for treatment of PDPH [5-7]. SPGB is a less invasive method of treatment for PDPH than epidural blood patch, and some have suggested it should be offered as first-line treatment [5]. We did a retrospective review of our institution's cases from the previous ten months and have included here a series of four patients who received the SPGB for PDPH with varying results.

Introduction

We performed a retrospective review of patients treated for PDPH from June 2016 through April 2017. IRB approval for the review was obtained. All patients with a headache were evaluated by an anesthesia provider. Patients were given information about both a SPGB and an Epidural Blood Patch (EBP) and could elect to have either, neither or both as treatment. We included those patients who were determined by an anesthesia provider to fit criteria for a PDPH and who chose to have a SPGB as their treatment modality. Patients who were less than 18 years of age or had any intracranial pathology were excluded from this study. All SPGBs were performed with the same technique. Patients were placed in supine position and received bilateral transnasal SPGB with 4% lidocaine applied with cotton tip applicators. The applicators were soaked in local anesthetic, and then one applicator was placed in each nostril, aiming for the posterior middle turbinate. The applicators were left in place 5 minutes, removed, re-soaked in lidocaine, and then replaced. This was repeated for a total of 20 minutes. In addition, after the applicators were initially placed, several additional drops of 4% lidocaine were dripped down the shaft of the applicator onto the cotton tip and into the pterygopalatine fossa. Four patients met criteria for inclusion, and the data was collected and reported.

Results

Patient 1

The first patient was a 27-year-old female, who presented in labor at 32 weeks gestation. After multiple epidural attempts, she had an inadvertent dural puncture, and a catheter was threaded intrathecally and used for continuous labor analgesia. At catheter removal, CSF was noted to be leaking from the catheter, as the cap had come loose. The patient complained of a bi-frontal positional headache, dizziness, and nausea with ambulation. Her pain was assessed on a VASS scale of 0-10 and was reported to be a 10/10. She was reportedly unable to move from the supine position. After 24 hours of conservative treatment with fluid and non-steroidal anti-inflammatory agents, a blood patch was attempted that resulted in a second dural puncture. The patient then elected to try SPGB. Prior to the block, her pain was still 10/10. Immediately after the block and 10 minutes after, the patient

reported a decrease in her pain to 4/10 as well as alleviation of her other symptoms, even with elevation of the head of the bed. Upon follow-up, patient reported her pain and symptoms returned 2 hours after block application. The patient went on to receive a blood patch placed in Interventional Radiology, which resulted in prolonged relief of her symptoms.

Patient 2

A 26-year-old female at 37 weeks gestation status-post spinal anesthesia for primary cesarean section. Spinal placement was difficult, requiring two attempts. On post-operative day 1, the patient complained of a frontal-occipital headache worsening with postural changes. Prior to SPGB, the patient's pain score was 4/10. After the block, the patient reported immediate relief with a pain score 0/10. At 10 minutes and 24 hours following the block, the patient reported continued relief of headache with a pain score of 0/10.

Patient 3

29-year-old female presented in active labor at 39 weeks gestation and received a lumbar epidural catheter for pain control. Despite no indication of a dural puncture on placement of the epidural, on post-partum day 1 the patient developed a 7/10 headache, which met criteria for PDPH. A SPGB was performed, and the patient's pain decreased to a 0/10 immediately after and at 10 minutes. Pain relief lasted for 24 hours, but then slowly returned. The patient presented to the emergency room 2 days after the SPGB and received a blood patch, which resulted in prolonged pain relief.

Patient 4

30-year-old female presented as a transfer from an outside hospital, where she had received an epidural for pain control. Epidural placement required multiple attempts and was complicated by dural puncture. At the outside hospital, a blood patch was performed with initial relief, but she noted pain and headache returned after straining overnight. On admission the patient reported a 10/10 headache with postural changes. A SPGB was performed at bedside, and the patient's pain decreased to a 4/10. At this time patient stated her headache was well controlled, and she desired discharge. The patient was instructed on how to perform the block on herself should the pain return, and given supplies to do so (cotton tipped applicators and 2% viscous lidocaine). The patient also performed the block on herself one time prior to discharge under the supervision of the pain team to ensure proper technique.

Discussion

The currently theorized major mechanism for pain in a PDPH is cerebral vasodilation. The vasodilation is a compensatory response secondary to the loss in cerebrospinal fluid that occurs with a dural puncture. The Sphenopalatine Ganglion (SPG) is an extra cranial parasympathetic ganglion located in the pterygopalatine fossa, posterior to the middle nasal turbinate, and anterior to the pterygoid canal. The ganglion has both sympathetic, parasympathetic, and somatic sensory roots. It is about 5 mm in size surrounded with a thin layer of connective tissue and mucous membrane, so local anesthetic penetrates easily with topical application. Blockage of these nerve fibers with a SPGB can decrease the cerebral vasodilation, therefore leading to relief from the headache [8,9]. However, there has been little evidence thus far on the efficacy of the SPGB for a PDPH. The

block was first suggested as a treatment for PDPH in a 2009 letter editor by Cohen et al., [10]. Cohen described his experience in treating 13 patients, 11 of whom received relief from a SPGB. In 2014, Cohen again described their experience with 32 parturients, of whom 69% were treated successfully with SPGB and did not require an EBP [5]. Patel et al., went on to present a poster on a retrospective study on patients at the same institution [11]. They showed a 63% success rate with SPGB with lower rates of complications. Aside from the interesting data from that particular institution, the only other published literature is one case series of 3 patients, and one case report [6,7]. While all of these studies showed good results, further studies are needed to confirm its efficacy for PDPH.

Despite its utility, SPGB will not likely replace EBP as the gold standard treatment. However, it is important to have alternative options for patients desiring less invasive procedures, those that were difficult initial epidural placement so therefore high risk of second dural puncture, or even those with contraindications to a second neuraxial procedure such as the use of an anticoagulant. While our numbers are small, our cases reveal several unique uses for the SPGB in treating PDPH, including: 1) providing an alternative therapeutic option for patients desiring less invasive treatments, 2) serving as an adjunctive therapy in patients with severe pain who needs an EBP, and 3) providing a means to continue patient-directed pain control in the outpatient setting.

In patients, who have tried and failed a blood patch, like our fourth patient, it is reasonable to attempt a SPGB before moving to a second blood patch. This particular patient adamantly refused a second, potentially painful blood patch. The SPGB was successful in relieving her pain while sparing her further discomfort of undergoing another invasive procedure. It is also important to note that allowing the patient to treat herself with a follow-up SPGB should the pain return allowed her to have an earlier discharge and increased patient satisfaction. A repeat SPGB could have potentially been a great treatment option for our third patient as well since she initially had substantial pain relief from a SPGB. Performing a repeat block if it is successful initially and/or teaching patients to self-administer the block is an important option to consider for select patients.

In patients, like our first patient, who need and would ultimately benefit from a blood patch, but in whom severe pain limits their ability to undergo a blood patch, the SPGB is a useful adjunctive therapy. Femoral and fascia iliac blocks have been used in hip fracture patients to allow the patient to assume the lateral decubitus position for spinal without the use of parenteral opioids [12,13]. The SPGB can be used to reduce patients' pain enough to allow them to tolerate a blood patch. In our patient, the inability to deviate from the supine position due to severe pain made it difficult for her to sit for an EBP, which likely contributed to the failed first attempt at EBP. However, undergoing SPGB could potentially reduce her pain enough to allow her to successfully sit for the second attempt at EBP.

One unfortunate downside of the SPGB is it appears to have short-term pain relief. Most likely once the local anesthetic effects wear off, the ganglion is no longer blocked, and cerebral vasodilation occurs once again leading to pain. PDPHs are generally self-limiting; therefore, regardless of treatment patients should recover within 7-10 days [1,2]. The hope with the SPGB is that it provides some relief for patients during this time frame until they can heal and recover

from the headache on their own. The ability to repeat the block and also teach patients to self-administer at home negates some of the downside of this short-acting block. Complications are rare and generally minor, including discomfort and burning during the procedure, unpleasant taste or numbness in the patient's mouth and potentially epistaxis.

Although research is currently still limited on the use of SPGB, all reports have demonstrated very promising results. Our case series adds to the literature by showcasing some positive patient outcomes, and by revealing some novel uses for the block. While more research needs to be done on this topic to establish best practice, we recommend offering this block to those patients with a diagnosed PDPH who desire a trial of a less invasive treatment.

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