

Bilateral Sphenopalatine Ganglion Block for the Treatment of Post Dural Puncture Headache: A Case Report

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Abstract

Background: Post dural puncture headache (PDPH) is a known and potentially debilitating complication of neuraxial anesthesia that can impede patient recovery. The conventional treatment includes hydration and symptomatic treatment like simple analgesics. Those who have unremitting symptoms following conservative measures are offered an epidural blood patch (EBP). However, EBP, an invasive procedure, is associated with complications in itself. **Case:** We report a 40-year-old man who experienced PDPH after spinal anesthesia. His symptoms recurred after conservative management was instituted. He was then offered a trans-nasal sphenopalatine ganglion (SPG) block. He had excellent pain relief and did not require an EBP. **Conclusion:** SPG blocks can be considered early in the treatment of PDPH together with general supportive measures. However, if pain relief is not achieved, an epidural blood patch should still be considered.

Keywords

Pain Management, Postdural Puncture Headache, Sphenopalatine Ganglion Block

1. Introduction

Postural headaches following interventions that disrupt meningeal integrity are most commonly labeled post dural puncture headaches (PDPHs). PDPH is a debilitating complication of neuraxial anesthesia that can occur following spinal anesthesia and with inadvertent dural puncture during epidural anesthesia. Patients suffering from PDPH can experience severe headaches resulting in delayed recovery from surgery, longer hospital length of stay and increasing health care

costs. Epidural blood patch (EBP) has been thought of as the gold standard of treatment for patients in whom conservative measures do not provide enough relief from symptoms. However, EBP itself is an invasive procedure, often painful and risks another inadvertent dural puncture during the procedure. EBPs have been associated with meningitis, cauda equina, epidural infection and permanent paresis [1]. The sphenopalatine ganglion block (SPG) has been used to treat acute/chronic facial pain syndromes. The trans-nasal SPG block is a simple, non-invasive, bed-side procedure that has been shown to be effective in treating PDPH in small studies/case series, indicating it could be a useful alternative approach to managing PDPH. We discuss our success with this block in managing one of our patients.

2. Case Report

Our patient is a 40-year-old man, BMI 31.7 kg/m², with a history and physical examination suggesting likely obstructive sleep apnea (OSA) and possible difficult airway. He was listed in emergency theatre for drainage/saucerisation of a groin abscess. He was counselled for both spinal anesthesia and general anesthesia. A neuraxial technique was recommended in view of possible OSA and difficult airway. Risks of PDPH, bleeding, infection, nerve injury, failure of regional technique with a need for conversion to general anesthesia were explained to him. Patient was keen for Spinal Anesthesia with sedation.

Subarachnoid block was performed in the sitting position by a senior anesthetist with 25 G Quincke needle. It was successful at first pass and clear free flowing CSF was aspirated. 2.5 mls of 0.5% heavy bupivacaine and 15 mcg of fentanyl were administered. Procedure was uneventful. Block receded and patient was able to ambulate/shower later that day. However, at night on post-operative day (POD) 0, he started to experience giddiness and headache when sitting up or elevating head more than 45 degrees. No other neurological symptoms/visual blurring/nausea/vomiting were reported by patient.

This was likely PDPH in view of postural nature of the headache, and timeline of presentation. The patient was reassured and the etiology of PDPH, as well as the management plans were explained to him. Patient was counselled about possibility of performing an epidural blood patch if symptoms didn't resolve with conservative measures or worsened.

Intravenous hydration was commenced, caffeine and simple analgesics were prescribed. Patient was placed on fall precautions. By the evening of POD1, giddiness has resolved. He still had some aching sensation at the back of neck and head when sitting up for more than 5 min.

On POD 2, he was sitting up in bed and stated that he felt symptomatically better; the headache had resolved with hydration and caffeine. Patient was keen for discharge and was informed to return if symptoms recurred/worsened or if he developed any other neurological symptoms.

Phone follow up on POD 3 was carried out. Patient had gone for outpatient change of dressing. After ambulating for 5 min, he experienced headache, gid-

diness, nausea and 1 episode of vomiting. We recommended readmission for symptomatic treatment and imaging studies to exclude other more sinister pathologies. We also discussed his case with the neurologist on call, who concurred symptoms are in keeping with intracranial hypotension, and that a computed tomography (CT) scan to rule out other causes of headache or subdural bleed from intracranial hypotension should be performed.

Patient was readmitted on POD 3 and CT scan done at the emergency department was normal. He was offered a bilateral sphenopalatine ganglion block for symptomatic relief. Though the evidence is low grade, it is a simple and minimally invasive block as compared to an epidural blood patch. Patient was keen for the block. Bilateral SPG block was performed at bedside with 4% lignocaine. He had symptomatic relief within 15 minutes, and was able to sit up in a wheelchair for transfer to the general ward. He was started on intravenous 2.5 L/day hydration, regular oral analgesics (paracetamol, diclofenac), metoclopramide and encouraged to have caffeinated drinks.

On POD 4, his symptoms were much improved. On POD 5, symptoms had completely resolved. Patient was discharged well on the morning of POD 6.

3. Discussion

The International Classification of Headache Disorders, categorizes PDPH as a headache developing within 5 days after dural puncture and disappears spontaneously within 1 week, or up to 48 h after an epidural blood patch. This headache may be associated with neck stiffness, tinnitus, hypoacusia, photophobia, and nausea [2]. The cardinal feature of PDPH is its postural nature, with headache symptoms worsening in the upright position and relieved, or at least improved, with recumbency [3].

The overall incidence of PDPH following spinal anesthesia (in non-obstetric patients) aged 15 - 45 years old is 2.0% (95% CI 0.9% - 4.4%) [4]. Patient risk factors for PDPH include young age, female sex, and pregnancy; young patients are at higher risk of developing this condition than older individuals. The type, size and orientation of needle are also important factors in developing PDPH. Cutting needles (Quincke needles) are associated with a higher incidence of PDPH compared to blunt or pencil-point needles (Sprotte and Whitacre needles). Bigger bore needles are associated with a greater incidence of PDPH. Orientating the needle bevel parallel to the long axis of the spine, results in decreased disruption of dural fibers, and a lower incidence on PDPH [5].

The precise mechanism of PDPH remains unknown; it has been proposed that the headache is caused by the continuous cerebrospinal fluid (CSF) loss through the dural tear after a dural puncture, which leads to decreased intracranial volume [6]. The intracranial volume is then restored by compensatory vasodilation, in accordance with the Monro-Kellie doctrine, mediated by parasympathetic activity, which along with traction on the pain sensitive intracranial structures, leads to a throbbing headache. Even after the restoration of the intracranial volume after vasodilation, the parasympathetic activity continues.

Sphenopalatine ganglion (SPG) block inhibits parasympathetic activity, which in turn inhibits this vasodilation. By attenuating the uncontrolled vasodilation, PDPH is relieved [7]. The SPG, also known as the pterygopalatine ganglion, is a triangular-shaped, extra-cranial parasympathetic ganglion, located in the pterygopalatine fossa, posterior to the middle nasal turbinate, and maxillary sinus (Figure 1). It is about 5 mm in size, with a thin layer of overlying connective tissue, allowing for effective topical absorption of drugs [8]. Although essentially a parasympathetic ganglion, the SPG forms a junction with multiple neural connections including autonomic and sensory innervations [9]. By inhibiting these conduction pathways, the SPG block has shown some success in managing various headache and facial pain syndromes.

Performance of the trans nasal SPG can be done at the bedside, or in an outpatient setting. It is a safe, easy to perform procedure with main exclusion criteria being base of skull fractures, recent nasal surgery or patient inability to co-operate with procedure. The patient is placed in a supine position with a pillow placed under both shoulders to have his/her neck extended. Alternatively, a shoulder roll can be used as well. A long applicator with a cotton swab at the tip is soaked with local anesthetic(s) of your choice; we used 4% lignocaine for our case for a quicker onset. The swab stick is inserted parallel to the floor of the nose until resistance is encountered, where it contacts the posterior pharyngeal wall superior to the middle turbinate (Figure 2). The applicator should be retained in the nostril for 5 - 10 minutes and then removed. The procedure is repeated in the other nostril with a new applicator. The swab does not come into direct contact with the ganglion, however the local anesthetic infiltrates around it in that position. The connective tissue and mucous membranes covering facilitate the spread and penetration of the drug [10] [11]. This block can be later repeated if it proves successful at relieving PDPHs.

This SPG block does not address the CSF leak, therefore other supportive measures must be continued for a few days until complete pain relief is achieved;

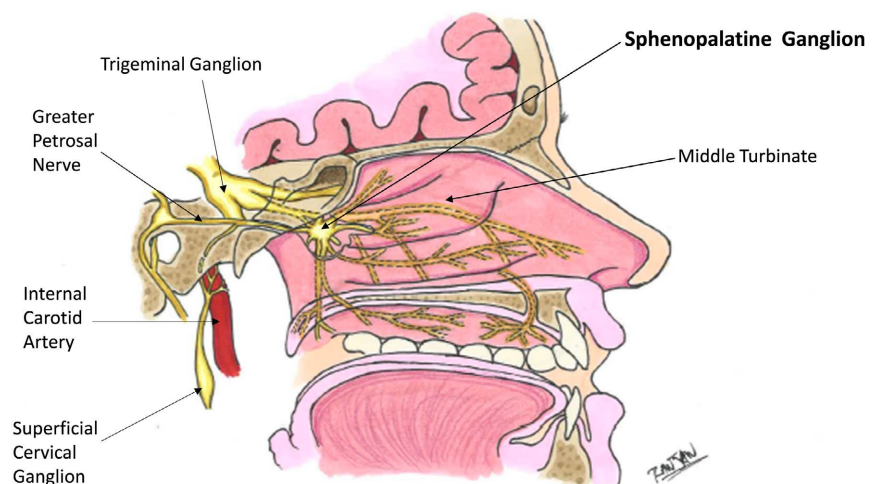


Figure 1. Sagittal view of the Nasopharynx showing the location of the SPG and its neural origins and connections.

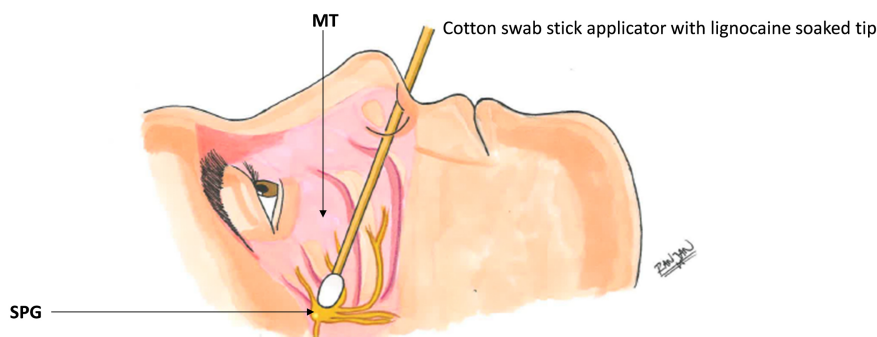


Figure 2. Technique for trans nasal sphenopalatine ganglion block (SPG: Sphenopalatine ganglion; MT: Middle turbinate).

these include bed rest, analgesics (acetaminophen or non-steroidal anti-inflammatory drugs), hydration, and laxatives [3].

An SPG block is classically indicated in acute and chronic facial/head pain syndromes like cluster headaches, trigeminal neuralgia, temporomandibular joint (TMJ) pain or complex regional pain syndromes (CRPS) [7]. The evidence for using SPG blocks for treatment of PDPH is limited to mostly case reports or case series. Kent and Mehaffey described the use of SPG block in three emergency department patients and three obstetric patients; All patients experienced immediate pain relief, however, two of the three patients in the emergency department had recurrent headaches and eventually received an EBP [12] [13]. Cohen *et al.* compared SPG block with EBP in a retrospective study of 81 patients; They found a larger number of patients with significant pain relief at 30 and 60 min after treatment with SPG block compared with EBP (39% vs. 21% and 71% vs. 31%, respectively). However, there were no significant differences in headache relief at 1, 2, and 7 days after treatment [14]. Jespersen *et al.* found that the administration of an SPG block had no statistically significant difference in pain intensity after 30 min compared with placebo when administered to patients with moderate to severe PDPH fulfilling their local criteria for EBP performance; Pain scores were however reduced by more than 40 mm VAS in most patients regardless of allocation, and an EBP was avoided for half of the patients in both groups [15].

4. Conclusion

In conclusion, although an epidural blood patch is considered the gold standard for managing moderate to severe PDPH, it is an invasive procedure. There is always the possibility of another inadvertent dural puncture, and if it does not provide complete pain relief, it has to be repeated. Unwanted complications have also occurred after an autologous EBP, such as meningitis, arachnoiditis, seizures, loss of hearing and vision, radicular pain, and neural deficits [16]. The SPG block is a simple, minimally invasive bedside procedure. The block can be repeated as necessary and if successful, the patient will be spared an EBP, preventing the possibility of the above complications and improving overall patient

satisfaction. It is generally well tolerated by patients and can be considered early in the treatment of PDPH together with general supportive measures. However, if the pain is not alleviated by these measures, an EBP should still be considered and offered to patients.

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Conflicts of Interest

The authors declare no conflicts of interest.

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