

Sphenopalatine Ganglion Block for Postdural Puncture Headache

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Abstract

Post-dural puncture headache (PDPH) is a relatively common complication associated with neuraxial anesthesia and unintentional dural puncture. Epidural blood-patch (EBP) is the gold standard treatment when conservative therapy fails, but has significant risks associated. Recently, bilateral sphenopalatine ganglion block (SPGB) has emerged as an alternative and safe technique in patients with PDPH. Although, there are still few cases reported in the literature. The authors describe two cases of PDPH with resolution after performance of bilateral SPGB.

Case 1: Male, submitted to knee arthroplasty under a combined neuraxial anesthesia, with accidental dural puncture with a Tuohy needle. On the third postoperative day, the patient reported frontal headache, exacerbated by orthostatism. The authors performed a bilateral transnasal SPGB and the patient reported clinical improvement, being discharged the next day without any symptoms.

Case 2: Pregnant in labor. Epidural space approach with accidental dural puncture. On the second day postpartum, she started with PDPH symptoms, being decided conservative treatment. Two days later, the authors opt to perform a bilateral SPGB. After that, the puerpera has complete relief, being discharged 24 hours later. SPGB, although widely described in the control of headache in the context of chronic pain, has gained increasing interest for the treatment of PDPH because it is a safe and effective technique. In the literature, however, there are few reports of its use in the treatment of PDPH. The two cases described suggest a simple, minimally invasive use and with great potential in the treatment of PDPH.

Keywords: Sphenopalatine ganglion block; Postdural puncture headache; Epidural bloodpatch

Introduction

PDPH is a relatively common complication associated with neuraxial anesthesia and unintentional dural puncture and its incidence varies with the size and the design of the needle used (ranging from 0.4% to 36% with the use of Quincke needles, depending on their size. While the incidence with pencil-point needles of the same size is significantly lower: 0% to 5%) [1,2]. Other risk factors for PDPH include female gender, history of headache, age between 20 and 40 years old, and orientation of the bevel perpendicular to the longitudinal fibers of the dura (the latter seems to have no strong evidence).

The PDPH clinic is very characteristic, with frontal and/or occipital headache, exacerbated with orthostatism, and relieved in decubitus [1,3], which appears 6 to 72 hours after the procedure (90% starts up to 3 days after the procedure and 66% in the first 48 hours). Other symptoms may also be associated, such as nausea, dizziness, stiff neck, visual and/or auditory changes. Without any treatment, PDPH can persist for about two weeks (it is estimated that 72% of cases will resolve spontaneously after 7 days) [1].

For anesthesiologists, treating PDPH has always been challenging. An autologous EBP is the gold standard therapy for treating PDPH, with efficacy of up to 75% [1,4], when conservative treatment (consisting of bed rest, non-steroidal anti-inflammatory drugs, caffeine, sumatriptan, antiepileptic medication and hydration), fails,

but has significant risks associated, including pain, dural puncture, and infection [5]. The sphenopalatine ganglion is a parasympathetic ganglion, located in the pterygopalatine fossa. Transnasal SPGB has been successfully used to treat chronic conditions such as migraine, cluster headache, and trigeminal neuralgia, and may be a safer alternative to treat PDPH: It is minimally invasive and carried out at the bedside without using imaging. Besides that, it has apparently a faster start than EBP, with better safety profile [6,7].

Materials and Methods:

The authors describe two cases of PDPH with resolution after performance of bilateral SPGB. Vital signs were measured on both patients during the procedure and the numeric rating scale (NRS): 0-10, was used to quantify the pain level while in the pre-procedure, immediately post-procedure, and 24 hours post-procedure.

Patient 1 was a 44-year-old man, with no pathological history, submitted to knee arthroplasty under a combined neuraxial anesthesia, with accidental dural puncture with the Tuohy needle. It was decided to replace the epidural catheter in the intervertebral space immediately above, without complications. On the third postoperative day, the patient reported frontal headache rated as a 7/10 in intensity, exacerbated by orthostatism, associated with cervicalgia, but he is only referred to anesthesiology on the fifth postoperative day. We did not observe cervical stiffness. After discussing with the patient and obtaining his consent, we performed a bilateral SPGB with two cotton-tipped applicators saturated with 2% lidocaine and 0.5% ropivacaine, under standard ASA monitoring. Cotton tipped applicators (one for each nostril) were introduced parallel to the floor of the nose and

advanced until resistance was felt. Each cotton tipped applicator was left in place for about 10 minutes (min). Symptoms relief was reported 5 minutes after the block (sitting NRS score was 0/10). The patient was discharged the next day without any symptoms.

Patient 2 was a 33-year-old pregnant woman, 1.57 m and 130 kg, with a history of depression and morbid obesity. She had an inadvertent dural puncture during attempted placement of an epidural catheter for labor and subsequently was decided to replace the epidural catheter in the intervertebral space immediately above, uneventfully. On the second post-delivery day, she started with PDPH symptoms, which she rated as 8/10 in intensity while sitting, being decided conservative treatment, given the complexity of the epidural technique in this puerpara and the hypocoagulation instituted. She was treated with oral analgesics, caffeine, and corticosteroids, which provided a little relief (6/10 NRS score), and she returned 2 days later with the same PDPH intensity (8/10). She consented for bilateral SPGB, and immediately following the procedure (same technique as described above in patient 1), her sitting NRS score was 0/10. The 24 hours follow-up NRS score was 0/10 as well, and the pregnant was discharged.

The both patients had significant pain relief following the bilateral SPGB without the need for EBP. They were monitored for an hour after the SPGB, prescribed ibuprofen 400 mg every 8 hours for the following 2 days, and were advised to go to the hospital in case of recurrence of symptoms.

Discussion

The pathophysiology of PDPH is thought to be due to the continuous loss of cerebrospinal fluid (CSF) at the point of approach of the dura-mater, which is higher than the production rate, with consequent traction of the meninges, and parasympathetic mediated reflex vasodilatation of the meningeal vessels. Although the CSF decrease is evident, the exact mechanism of this headache remains to be clarified. Other mechanisms seem to be involved in the pathophysiology of PDPH, namely vasodilatation of intracranial vessels, which appears as a compensatory response to decreased intracranial pressure: according to the Monro-Kellie hypothesis [8], the sum of brain volume, CSF and blood in the intracranial compartment remains constant, which means that if the volume of one component is reduced, the volume of another component increases to maintain a balance and vice versa. One of the contributors to this vasodilation is mediated by the parasympathetic activity of neurons that have synapses in the sphenopalatine ganglion, explaining in part the relief of PDPH after the SPGB [9]. The excruciating headache is the result of uncontrolled vasodilatation. By attenuating this with a bilateral SPGB, the vasodilatation is addressed, and the patient also receives symptomatic relief [10].

There are reports of bilateral transnasal SPGB for the treatment of PDPH, demonstrating a safety profile and fast relief of headache. It is simple, and therefore, it can be done bedside in wards, or in the outpatient department, and does not need fluoroscopy or an operating room. The patient needs to be in a supine position with the neck extended. A long applicator with a cotton swab at the tip is soaked with local anesthetic and is inserted parallel to the floor of the nose until resistance is encountered (it will be at the posterior pharyngeal wall superior to the middle turbinate). The cotton swab should be retained in the nostril for 5-10 minutes and then removed. The procedure is similarly repeated in the other nostril. The swab does not come into

direct contact with the ganglion, however the local anesthetic infiltrates around it in that position [10,11]. Although contraindicated in patients with basilar skull fractures, bilateral SPGB may be an excellent alternative to EBP if there is a contraindication for that (evidence of infection elsewhere than the nasopharynx, or hypocoagulation), being a non-invasive technique, simple and effective. The success rates of this treatment appear to be very similar to that of EBP [12-14]. Recently, the bilateral SPGB has been successfully used in patients with PDPHs, although fewer patients were offered this block. When comparing the risks of a transnasal SPGB, which include bleeding and temporary discomfort against those of an EBP it seems reasonable to offer the SPGB before EBP [15,16].

Cohen et al. [7] published their experience with 13 puerparas with moderate to severe PDPH, submitted to bilateral SPGB for resolution of the symptomatology. Eleven of these patients presented good pain relief after this technique, while the remaining two puerparas required EBP for resolution of PDPH.

Patel et al. [14] presented the retrospective data of 72 patients collected over 17 years in the form of a poster. They divided the 72 patients who had PDPH into two groups. One group (33 patients) underwent bilateral SPGB, while in the other group (39 patients), they received EBP. It was found that at the end of 1 hour, patients in the SPGB group had good pain relief compared to the EBP group. However, after 24 hours there was no significant difference observed in either group. It should be noted, however, that more complications were observed in the EBP group.

Kent and Mehaffey [17] published their experience with 3 parturients diagnosed with PDPH, who were offered a bilateral transnasal SPGB. All 3 patients had good pain relief and none of them required a salvage EBP.

If more physicians were familiar with this technique, it could potentially be used as a first-line therapy. However, the data available is scarce at the moment, and is available in the form of case reports and case series. We suggest that patients presenting with PDPH should be considered primarily for bilateral SPGB. Patients may have a rescue EBP if needed.

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