Case Report

Sphenopalatine ganglion block for headache after accidental dural puncture in a child: a case report

Abstract

Background: PDPH is a well-recognized complication of anesthesia in the neuraxial. Few cases have been reported in children. EBP is more difficult in children, as it requires sedation or even general anesthesia. The SPG block is an effective, low-risk treatment option for PDPH refractory to conservative management. We will report a case of unnoticed accidental perforation of the dura mater, with the appearance of PHPD 48 hours after anesthesia, treated with SPG block**.**

Case report: Female patient, aged 3 years and 9 months, weighing 20 kg, ASA I. Coagulogram and complete blood tests were normal. Abbreviation of fasting with orally 10 ml/kg of 12.5% maltodextrin between 2-4 hours before umbilical hernia correction. Monitoring, venoclysis (#22G), inhalation anesthesia with sevoflurane under the Baraka method. Asepsis and antisepsis, lumbar puncture with pediatric epidural needle (22G), injection 10 ml 0.25% levobupivacaine. The surgery duration is 40 minutes. PACU without motor blockage of the lower limbs. After 48 hours, she sought emergency care at the hospital with a typical PDPH after accidental puncture of the dura mater, without the anesthesiologist's perception. On the 5th postoperative day, the child presented refractoriness, leading to limitations in daily activities, SPG block with 1% lidocaine was performed with immediate success. Discharged home without a headache.

Conclusion: Occurrence of PDPH after lumbar puncture in children is rare. SPG block has been an alternative for the use of EBP. The novel approach described in this report has minimal risks of discomfort or injury to the nasal mucosa. We believe that SPG block is a feasible, easy, safe, inexpensive, and well-tolerated treatment, being an option for the treatment of PDPH in children. Using five publishing sites this is the 1st SGP block in children.

Keywords: sphenopalatine ganglion block, post-dural puncture headache, epidural blood patch, pain management, lidocaine

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Key points

What is already known?

A. PDPH can occur after perforation of the dura mater.

B. Occurrence of PDPH after lumbar puncture in children is rare.

C. Performing EBP in children is a difficult technique.

D. The role of the SPG in the pathogenesis of pain was first described in 1908.

E. The use of the SPG block has been proposed as a treatment option for a variety of pain syndromes.

F. SPG block in children was not found in the literature consulted.

What this case report adds.

a. Searching four search platforms, no SPG was found in children.

b. This is the first successful case with a child aged 3 years and 9 months.

c. PDPH appeared after 48 hours due to accidental perforation of the dura mater.

d. On the 5th day, the child still had a headache and remained lying down the entire time.

e. SGP block with 1 ml of 1% lidocaine in each nostril completely disappeared the PDPH.

Introduction

Post-dural puncture headache (PDPH) continues to be a complication that occurs in spinal anesthesia, epidural anesthesia with perforation perceived or not, and combined spinal-epidural block. In 40 children aged 1 to 5 years undergoing spinal anesthesia with a 26G Atraucan needle, PDPH was not observed.[1] In another study with 307 children under 13 years old using the same needle, three children developed PDPH, aged 2, 4, and 12 years.[2] Believed that PDPH was rare in children, due to low CSF pressure, high elasticity of the dura mater, and non-ambulation. However, there are reports of children as young as 2 years old, suggesting that it can occur at any age.[2,3] The symptoms were mild and treated successfully with bed rest, hydration, and dipyrone.

In a retrospective study over 10 years, the need and effectiveness of epidural blood patch (EBP) in children and adolescents was evaluated, demonstrating that if PDPH symptoms are severe and are not relieved with conservative treatment, EBP is a highly effective procedure in pediatric patients.[4] The sphenopalatine ganglion (SPG) is a parasympathetic ganglion, located in the pterygopalatine fossa. The SPG block has been used for a long time for treating headaches of varying etiologies, and anesthesiologists are using this technique for PDPH.[5] We will report a case of PDPH due to accidental perforation during epidural anesthesia in a child aged 3 years and 9 months treated with modified SPG block material, with immediate success.

Case report

Female patient, aged 3 years and 9 months, weighing 20 kg, ASA I, with no history of anesthetic or allergies. The coagulogram and complete blood count laboratory tests were unremarkable. All anesthetized children were part of an abbreviated fast after registration on Plataforma Brazil (CAAE: 09061312.1.0000.5179). The Ethics

Research Committee approved the study protocol (n=171,924), and older children and parents were informed and agreed to participate in the study. The child is given orally 10 ml/kg of 12.5% maltodextrin between 2-4 hours before surgery fasting abbreviation, for surgical treatment of umbilical hernia correction. After welcoming the patient and guardian in the operating room, monitoring was carried out with a cardioscope, pulse oximeter, and children's cuff to measure non-invasive blood pressure. Inhalation induction was performed with 8% sevoflurane under a face mask and Baraka-type anesthesia device, followed by venoclysis with 22G extracath in the left upper limb and injected with fentanyl 1 µg/kg, dexamethasone 0.1 mg/kg, dipyrone **30 mg/kg**, ondansetron 0.1 mg/kg and inhaled maintenance with sevoflurane 4%.

The child was positioned in the left lateral decubitus position and, after local asepsis with 0.5% alcoholic chlorhexidine, the epidural space between L2-L3 was punctured with a 22G Tuohy pediatric needle, confirmed with Dogliotti's test, and 10 ml of 0.25% levobupivacaine without vasoconstrictor was injected. The surgical procedure lasted 40 minutes, without complications and the child remained on spontaneous ventilation with rapid awakening. Transferred to the PACU without any degree of motor blockade of the lower limbs and with a visual analog scale with a value of 1 for pain. He was later discharged to the ward awake and without pain. After 48 hours, she sought emergency care at the hospital with a typical headache after an accidental puncture of the dura mater (PDPH), characteristic of the frontal and temporal regions, worsening in the upright position and improving in the supine position, being treated with dipyrone and discharged after improvement. On the 4th day after surgery, still in pain (presenting easy pain and crying) she was reevaluated with blood count, white blood cell counts, and C-reactive protein tests, which showed no changes. It was then decided to optimize oral analgesia with common analgesics and combine anti-inflammatory drugs, in addition to rest and increased water intake. On the 5th postoperative day, the child presented refractoriness, leading to limitations in daily activities. The SPG was blocked with 1% lidocaine, 3 ml in each nostril, using a swab adapted with a 40x1.2 needle and 3 ml syringe, observing an instantaneous improvement in pain (Figure 1). After performing the SPG block, the child remained standing for 30 minutes, without pain appearing and was discharged from the hospital.

Figure 1 Model designed to facilitate injection into the SPG block in children.

Discussion

PDPH was thought to be rare in children <10 years of age, because of low CSF pressure, highly elastic dura mater, and non-ambulation.[6] However, there are reports of PDPH in patients as young as 2 years old, and symptoms are generally mild.[2,3] PDPH appeared after an epidural puncture with a 20G pediatric needle. The child developed PDPH 48 hours after the epidural puncture, probably due to accidental perforation of the dura mater without the anesthetist noticing. Until the 5th postoperative day, the child was refractory to clinical treatment, when SPG block was indicated, with instant improvement of PDPH. Epidural blood patch (EBP) is the gold standard treatment for PDPH, patients are sometimes reluctant to undergo this therapeutic option because the procedure to treat the problem is the same procedure that caused the problem. An epidural blood patch (0.2-0.3 ml/kg) should be considered if the headache persists for more than a week.[4] And if the patient is a child, how do convince them and their parents, to perform the SPG block as an option to EBP that requires sedation or general inhalational anesthesia, and with the possibility of new accidental perforation? Despite being uncomfortable, the SPG block was performed calmly and with the child's contribution, without sedation.

The role of the SPG in the pathogenesis of pain and its use was first described as sphenopalatine neuralgia by Sluder in 1908.[7] The SPG is an extracranial parasympathetic ganglion located within the pterygopalatine fossa and contains the largest collection of neurons outside the brain. The use of the SPG block has been proposed as a treatment option for a variety of pain syndromes, such as headache syndromes including hemicrania continua, trigeminal neuralgia, and dural puncture headache.[8] A topical SPG block is a simple and minimally invasive procedure to treat PDPH, and small observational studies suggest effects comparable with EBP.[9–11] Because the patient was a child around 4 years old, the SPG block was chosen with the immediate disappearance of the pain. Minor adverse effects of SPG block are typically local and include epistaxis, transient anesthesia, or hypoesthesia of the root of the nose, pharynx, and palate and lacrimation of the **ipsilateral eye**, Major adverse effects are uncommon but can include infection in the setting of improper aseptic technique, and local or retroorbital hematoma.[8] In this case, there were no adverse effects of the SPG block with 3 ml of 1% lidocaine.

A blinded, randomized clinical trial with 40 patients with PDPH, compared SPG block with 1 ml (lidocaine 4% and ropivacaine 0.5%) or placebo (saline), and showed that the administration of an SPG block with local anesthetic had no statistically significant effect on pain intensity after 30 min compared with placebo.[12]. Recently, an SPG block approach with a percutaneous, 25G spinal needle-based route accessed with ultrasound was shown.[13] With this approach, local anesthetic is administered directly into the pterygopalatine fossa, without dependence on mucosal absorption, resulting in a more effective SPG block. In four adult patients with PDPH after one by lumbar puncture (without needle gauge), two by accidental perforation of the dura mater (without needle gauge), one CSF fistula associated with meningitis, were successfully treated by instillation of 2% plain lidocaine drops 1 mL (20 drops) into the nasal cavity, administered by the patient himself.[14] Using the title "SPG block in children for PDPH" in PubMed, Medline, Lilacs, Scielo, and Google Scholar no case was found in children under seven years of age, just a teenage case. Therefore, this is the first successful case with a child aged 3 years and 9 months.

Conclusion

PDPH is a potential expected complication of a lumbar puncture, with symptoms related to traction on pain-sensitive structures from low CSF pressure. Occurrence of PDPH after lumbar puncture in children is rare. Once the diagnosis is made, conservative therapy is recommended for 48 hours including bed rest, analgesics, and increased hydration since the natural history is one of spontaneous resolution. For persistent PDPH, an EBP should be considered, depending on age and parental consent. SPG block has been an alternative for the use of EBP, even in obstetric patients. We believe that SPG block is a feasible, easy, safe, inexpensive, and well-tolerated treatment, being an option for the treatment of PDPH in children. This technique should be evaluated in clinical trials to further validate it as a treatment option, mainly in children. Using five publishing sites this is the 1st SGP block in children.

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None.

Conflicts of interest

The author declares that there are no conflicts of interest.

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