Sphenopalatine Ganglion Block: A New Therapeutic Approach for Postdural Puncture Headache

Dipasri Bhattacharya¹, Subhra D Mistry²

Abstract

Introduction: Postdural puncture headache (PDPH) is one of the most exhausting complications of subarachnoid block or inadvertent dural puncture, leading to excessive leakage of cerebrospinal fluid (CSF) causing intracranial hypotension and demonstrable reduction in CSF volume.

The treatment of PDPH is a challenge for both the physician as well as the patient; various drugs and interventions have been tried, but the most effective of them being the epidural blood patch (EBP). It has a success ranging from 68 to 90% but is again an invasive procedure involving a repeat of dural puncture having known complications such as subdural hematoma, infection, meningitis, and delayed radicular pain. The use of noninvasive measures such as SPGB and occipital nerve block has been found to be almost equally effective when used in conjunction with conservative methods in comparison to the conventional gold standard method of EBP. Sphenopalatine ganglion block is absolutely a noninvasive intervention with minimal adverse effects and high efficacy, had been tried as a treatment modality of PDPH, and its success has been reported in a number of case series and case reports showing management of PDPH in obstetric patients and other patients. In all these publications, SPGB has been claimed as an effective measure for the treatment of PDPH by using it in conjugation with conservative treatment.

Windsor et al. demonstrated the effectiveness of SPGB through transnasal route for the treatment of headache in herpetic keratitis. Over the years, the role of SPGB had been found to be effective in various forms of headache by Cady et al. in the treatment of acute or chronic migraine. Similarly, Candido et al. used SPGB effectively in the treatment of headache and facial pain.

Kent et al. got remarkable good results with transnasal SPGB using 2% lignocaine in PDPH refractory to conservative measures in a study comprising 3 postcaesarian patients and proposed it to be a better alternative for EBP.

Postdural puncture headache (PDPH) is one of the most exhausting complications of subarachnoid block or inadvertent dural puncture, leading to excessive leakage of cerebrospinal fluid (CSF) causing intracranial hypotension and demonstrable reduction in CSF volume.

The treatment of PDPH is a challenge for both the physician as well as the patient; various drugs and interventions have been tried, but the most effective of them being the epidural blood patch (EBP). It has a success ranging from 68 to 90% but is again an invasive procedure involving a repeat of dural puncture having known complications such as subdural hematoma, infection, meningitis, and delayed radicular pain. The use of noninvasive measures such as SPGB and occipital nerve block has been found to be almost equally effective when used in conjunction with conservative methods in comparison to the conventional gold standard method of EBP. Sphenopalatine ganglion block is absolutely a noninvasive intervention with minimal adverse effects and high efficacy, had been tried as a treatment modality of PDPH, and its success has been reported in a number of case series and case reports showing management of PDPH in obstetric patients and other patients. In all these publications, SPGB has been claimed as an effective measure for the treatment of PDPH by using it in conjugation with conservative treatment.

Windsor et al. demonstrated the effectiveness of SPGB through transnasal route for the treatment of headache in herpetic keratitis. Over the years, the role of SPGB had been found to be effective in various forms of headache by Cady et al. in the treatment of acute or chronic migraine. Similarly, Candido et al. used SPGB effectively in the treatment of headache and facial pain.

Kent et al. got remarkable good results with transnasal SPGB using 2% lignocaine in PDPH refractory to conservative measures in a study comprising 3 postcaesarian patients and proposed it to be a better alternative for EBP.
concluded that SPGB is an effective method of treating PDPH with good success rate as compared to conservative treatment.

Puthveneettil et al. conducted a prospective unblinded observational study on 20 obstetric postcaesarian patients over a period of 1 year. Control group received intravenous paracetamol 1 g thrice daily and 75 mg diclofenac twice daily was used as rescue analgesic whereas the test group received transnasal SPGB with 2% lignocaine and then 1 g intravenous paracetamol thrice daily with tablet diclofenac 75 mg P/O twice daily was given as rescue analgesic if the pain score was more than 4 according to VAS scale after 2 hours. Pain was assessed before procedure, 30 minutes, 1, 2, 4, 6, 8, 12, and 24 hours after the procedure. Patients in both the groups without adequate pain relief for more than 3 days were considered for EBP. The primary objective was to study the efficacy of SPGB for the treatment of PDPH over conservative methods and the results showed accordingly.

Furtado et al. used ropivacaine 0.75% for SPGB in 4 obstetric patients yielding good results and Dubey et al. used 2 puffs of 10% lignocaine spray for transnasal SPGB with an intention to reduce the invasiveness compared to cotton-tipped applicators showing good results.

In another retrospective review, Cohen et al. compared SPGB with EBP on 42 and 39 patients, respectively, where residual headache, recovery from associated symptoms, and new treatment complications were studied between 2 groups at 30 minutes, 1 hour, 24 hours, 48 hours, and 1 week posttreatment. It showed that a greater number of patients had a significant relief in their PDPH and associated symptoms at 30 and 60 minutes after treatment with SPGB than after treatment with EBP (p value < 0.01).

Only the EBP patients complained of posttreatment complications all of which resolved in 48 hours thus concluding that a greater number of patients experienced a quicker onset of headache relief, without any new complications, from treatment with SPGB vs EBP.

Sphenopalatine ganglion block may attenuate cerebral vasodilation induced by parasympathetic stimulation which is transmitted through the neurons synapsing in the sphenopalatine ganglion. This is supported by the Monro-Kellie concept and would explain why caffeine and sumatriptan can have some effect on the treatment of PDPH. Sphenopalatine ganglion block has a faster onset than epidural blood patch with better safety profile.

References

1. Nafiu OO, Salam RA, et al. Post dural puncture headache in obstetric patients: experience from a West African teaching hospital. Int J Obstet Anesth 2007;16:4–7. DOI: 10.1016/j.joa.2006.05.001.
2. Atim A, Ergin A, et al. Epidural blood patch for the management of post-dural puncture headache. J Nervous Sys Surgery 2009;2:67–71.
3. Eddit R, van Kooten F, et al. Efficacy of the epidural blood patch for the treatment of post lumbar puncture headache BLOPP: a randomized, observer-blind, controlled clinical trial. BMC Neurol 2005;5:12. DOI: 10.1186/1471-2377-5-12.
4. Davies JM, Murphy A, et al. Subdural hematoma after dural puncture headache treated by epidural blood patch. Br J Anaesth 2001;86:720–723. DOI: 10.1093/boa/86.5.720.
5. Desai MJ, Dave AP, et al. Delayed radicular pain following two large volume epidural blood patches for post-lumbar puncture headache: a case report. Pain Physician 2010;13:257–262.
6. Matute E, Bonilla S, et al. A Bilateral greater occipital nerve block for post-dural puncture headache. Anaesthesia 2008;63:551–560. DOI: 10.1111/j.1365-2044.2008.05531.x.
7. Takmaz S, Ünal KC, et al. Treatment of post-dural puncture headache with bilateral greater occipital nerve block. Headache 2010;50:869–881. DOI: 10.1111/j.1526-4610.2010.01656.x.
8. Nair AS, Rayani BK. Sphenopalatine ganglion block for relieving postdural puncture headache: technique and mechanism of action of block with a narrative review of efficacy. Korean J Pain 2017;30(2):93–97. DOI: 10.3344/kjp.2017.30.2.93.
9. Cohen S, Levin D, et al. Topical Sphenopalatine Ganglion Block Compared With Epidural Blood Patch for Postdural Puncture Headache Management in Postpartum Patients: A Retrospective Review. Reg Anesth Pain Med 2018;43:880–884. DOI: 10.1097/AAP.0000000000000840.
10. Channabasappa SM, Manjunath S, et al. Transnasal sphenopalatine ganglion block for the treatment of postdural puncture headache following spinal anesthesia. Saudi J Anaesth 2017;11:362–363. DOI: 10.4103/sja.SJA_59_17.
11. Furtado I, Lima IF, et al. Ropivacaine use in transnasalsphenopalatine ganglion block for post dural puncture headache in obstetric patients-case series. Rev Bras Anestesiol 2018;68:42–44. DOI: 10.1016/j.bjan.2017.04.019.
12. Kochhar A, Khanooa S, et al. Evaluation of sphen-palatine block for the treatment of post-dural puncture headache following spinal anaesthesia: a randomized study. Eur J Pharm Med Res 2017(4):231–234.
13. Puthveneettil N, Rajan S, et al. Sphenopalatine ganglion block for treatment of post-dural puncture headache in obstetric patients: an observational study. Indian J Anaesth 2018;62:972–977.
14. Kent S, Mehaffey G. Trasnasalsphenopalatine ganglion block for the treatment of postdural puncture headache in obstetric patients. J Clin Anaesth 2016;34:194–196. DOI: 10.1016/j.jclinane.2016.04.009.
15. Windsor RE, Jahnke S. Sphenopalatine ganglion blockade: a review and proposed modification of the transnasal technique. Pain Physician 2004;7:283–286.
16. Cady R, Saper J, et al. A doubleblind, placecontrolled study of repetitive transnasalsphenopalatine ganglion blockade with tx360 as acute treatment for chronic migraine. Headache 2015;55:101–116. DOI: 10.1111/head.12458.
17. Candido KD, Massey ST, et al. A novel revision to the classical transnasal sphenopalatine ganglion block for the treatment of headache and facial pain. Pain Physician 2013;16:E769–E778.
18. Kent S, Mehaffey G. Transnasal sphenopalatine ganglion block for the treatment of postdural puncture headache in obstetric patients. J Clin Anaesth 2016;34:194–196. DOI: 10.1016/j.jclinane.2016.04.009.
19. Cardoso JM, Sá M, et al. Sphenopalatine ganglion block for postdural puncture headache in ambulatory setting. Rev Bras Anestesiol 2017;67(3):311–313. DOI: 10.1016/j.bjaane.2016.09.003.
20. Dubey P, Dubey PK. Intranasal lignocaine spray for sphenopalatine ganglion block for postdural puncture headache. Saudi J Anaesth 2018;12:364–365. DOI: 10.4103/sja.SJA_680_17.
21. Abdullayev R, Kucukebe OB, et al. Incidence of postdural puncture headache in ambulatory setting. Rev Bras Anestesiol 2017;67(3):311–313. DOI: 10.1016/j.bjaane.2016.09.003.
22. Abdullayev R, Kucukebe OB, et al. Incidence of postdural puncture headache: two different fine gauge spinal needles of the same diameter. J Obstet Anaesth Crit Care 2014;4(2):64. DOI: 10.4111/head.12458.