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# Transnasal Sphenopalatine Ganglion Block for Rescue of Post-Dural Puncture Headache After Combined Spinal-Epidural Anesthesia: A Case Report

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**ABSTRACT:**

Post-dural puncture headache (PDPH) is a common neuraxial anesthesia complication, often poorly managed conservatively. We report successful bilateral transnasal sphenopalatine ganglion block (SPGB) in a 52-year-old obese hypertensive woman (ASA II) who developed severe PDPH (pain 8/10) after accidental dural puncture during hysterectomy anesthesia. After 12 hours of failed conservative therapy, SPGB with 4% lidocaine reduced pain from 8/10 to 2/10 within 10 minutes, with complete resolution by 8 hours and sustained relief over 24 hours, no adverse effects. This case demonstrates transnasal SPGB as a rapid, effective, safe bedside alternative to epidural blood patch for PDPH.

**Keywords: Epidural anesthesia; Lidocaine; Pain; Post-dural puncture headache; Sphenopalatine; ganglion block.**

## INTRODUCTION:

Post-dural puncture headache (PDPH) is a common and unpleasant complication that can occur after spinal or combined spinal-epidural anesthesia. While most patients are initially managed conservatively, relief is often slow and incomplete.[1] Although an epidural blood patch is the definitive treatment, it is invasive. There are noninvasive methods for managing PDPH; however, the sphenopalatine ganglion block is a safe, noninvasive option. There are different approaches to the sphenopalatine ganglion block.[2] The transnasal sphenopalatine ganglion block (SPGB) is a simple, minimally invasive, and straightforward option that can provide quick relief.[3]

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## CASE REPORT:

A 52-year-old female patient, weighing 82 kg, was classified as ASA grade 2. She underwent a total abdominal hysterectomy utilizing combined spinal-epidural anesthesia at Lumbini Medical College in Palpa on March 4, 2026, at 9:45 AM. The patient had a documented history of hypertension and had been prescribed Amlodipine five mg once daily for the past five years. She reported no previous occurrences of headaches and possesses no significant history of prior surgical procedures or anesthesia. All preoperative investigations yielded normal results. The Mallampati score was assessed as one, and the spine was found to be midline and palpable. The patient's Body Mass Index (BMI) was determined to be 31.23 kg/m$^2$.

In the operating theater, ASA standard monitors were meticulously attached to the patient to facilitate the continuous monitoring of vital signs throughout the procedure. Intravenous access was successfully established, enabling the timely administration of medications and fluids. Preoperative fluid management was initiated with a preload of 15 mL/kg of Ringer's lactate to ensure adequate hydration. Following the implementation of strict aseptic techniques, the surgical site was thoroughly prepared through painting and draping to minimize the risk of infection. An 18-gauge Tuohy needle was employed to insert a 20-gauge epidural catheter at the L2–L3 intervertebral space. However, during this procedure, an accidental wet tap occurred, indicating an unintentional perforation of the dura mater. Consequently, the Tuohy needle was removed, and the same Tuohy needle was reinserted at the L1–L2 intervertebral space. A notable loss of resistance was encountered at a depth of 5 cm with air, confirming correct placement, and the catheter was subsequently secured at a depth of 10 cm.

To evaluate the efficacy of the epidural catheter, a test dose of 3 mL of lignocaine combined with adrenaline was administered. The patient's heart rate was closely monitored, and no significant changes were detected, indicating successful catheter placement and a

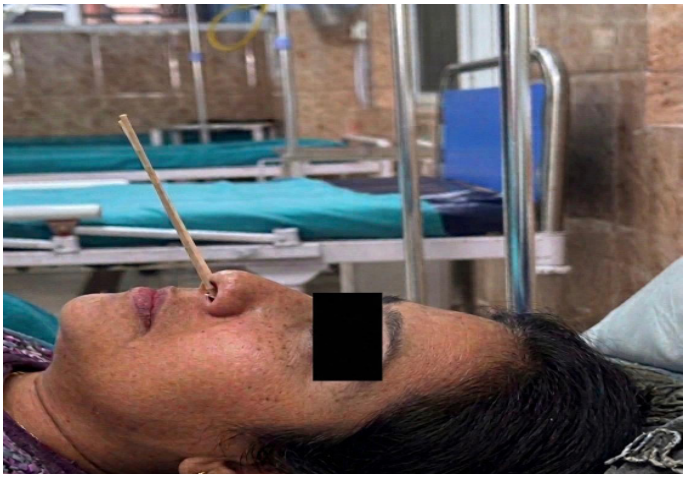

*Fig.1: Bilateral insertion of cotton-tipped applicators soaked in 4% lidocaine through the nasal cavities for transnasal sphenopalatine ganglion block*

low risk of immediate complications. Spinal anesthesia was administered at the L3–L4 intervertebral space utilizing a 25-gauge Quincke needle, delivering 2.8 ml of 0.5% bupivacaine and 25 mcg of fentanyl. The anesthesia maintained an effective sensory level up to T6, with the intraoperative period proceeding without incident.

The surgical procedure lasted a total of one hour and 45 minutes. Throughout the operation, five pints of Ringer's Lactate were infused. At one hour and fifteen minutes into the surgery, the epidural was activated via an injection of five ml of 0.5% Ropivacaine. In the postoperative recovery area, the patient was instructed to remain in a supine position for a duration of 12 hours, avoiding the use of a pillow or any elevation of the head. Medication administration continued for a duration of 12 hours in the post-operative unit via the epidural catheter. This protocol included the use of Ropivacaine 0.5% injection alongside 200 mcg of fentanyl, administered at a rate of five mL per hour. Continuous monitoring of the patient's blood pressure was conducted throughout their stay in the Post-Anesthesia Care Unit (PACU). Following the morning rounds, the patient was transferred to the ward, at which point the epidural catheter was removed. On the second postoperative day, the patient developed a headache. Upon assessment, the headache was severe, affecting the frontal and occipital regions. The pain intensified when she sat or stood, but improved somewhat when she lay flat. She rated the pain as eight out of 10 on the numerical scale, and it was accompanied by neck stiffness, photophobia, and nausea. The headache persisted for over 24 hours. Considering her history and the findings from the examination, a diagnosis of post-dural puncture headache was made. The patient was initially treated conservatively with bed rest, a lying-down position, fluids, and Paracetamol with caffeine. After 12 hours, we reassessed her condition. She reported only a slight improvement in her headache, despite the conservative management.

Because her pain had not improved, we performed a bilateral transnasal sphenopalatine ganglion block as a rescue procedure after obtaining written consent. The patient was placed in a supine position with her head slightly extended, using a pillow to support her neck. Two cotton-tipped applicators were soaked in four percent lidocaine from a three-ml syringe.[4] Both applicators were gently inserted simultaneously through each nostril, as shown in Figure 1, directed parallel to the floor of the nasal cavity, until resistance was encountered. The patient reported significant relief within 10 minutes, with a reduction in pain score from 8/10 to 2/10. The headache resolved completely within eight hours. Continuous blood pressure monitoring was performed following the procedure. The patient was kept fasting for four hours.[5] The relief persisted for over 24 hours, with no recurrence of symptoms and no side effects documented.

## DISCUSSION:

Transnasal sphenopalatine ganglion (SPG) block is a minimally invasive technique for managing post-dural puncture headache (PDPH), offering a promising alternative or adjunct to conservative measures and the more invasive epidural blood patch (EBP). Post-dural puncture headache results from cerebrospinal fluid (CSF) leakage after dural puncture, causing intracranial hypotension, compensatory vasodilation, and a characteristic positional headache. Traditional management begins with conservative measures (bed rest, hydration, caffeine, analgesics), but these often provide limited relief. Epidural blood patch remains the gold standard for refractory cases, yet it carries risks such as back pain, infection, or neurological complications.[6]

The SPG is a parasympathetic ganglion located behind the middle nasal concha and can be accessed through the nasal passages. Blocking this ganglion with local anesthetics, such as lidocaine, ropivacaine, or bupivacaine, delivered via soaked cotton swabs or applicators, is believed to interrupt the parasympathetic mechanisms that contribute to cerebral vasodilation, thereby reducing the intensity of headaches.[7]

The procedure is typically performed with the patient lying supine and the head extended. Soaked cotton swabs or applicators are advanced along the superior border of the middle turbinate toward the posterior wall of the nasopharynx. The swabs are usually left in place for approximately five to ten minutes, with repeat applications if necessary. This method is quick, can be performed at the bedside, and requires minimal equipment.[4]

Evidence indicates that the transnasal approach yields favorable outcomes, particularly by providing prompt short-term relief, reducing the need for EBP in select patients, demonstrating high tolerability, and exhibiting a favorable safety profile. Numerous studies, encompassing randomized controlled trials (RCTs), meta-analyses, case series, and retrospective reviews, confirm its efficacy.[8]

A 2023 meta-analysis involving nine RCTs (N=381) has shown that the transnasal SPG block is superior to conservative treatment for pain alleviation at intervals of 30 minutes, one hour, two hours, and four hours, resulting in fewer treatment failures, albeit with very low to moderate quality evidence as assessed by GRADE guidelines. Furthermore, it surpassed intranasal lidocaine administration at multiple time points extend-

ing up to 24 hours. Nonetheless, the advantages of the transnasal SPG block appear to diminish after six hours, and there is no significant enhancement in the need for rescue medication or adverse events in the long term.[6]

The RCT conducted by Jespersen et al., which included 40 patients meeting EBP criteria, compared the transnasal SPG block using local anesthetic (lidocaine 4% combined with ropivacaine 0.5%) versus saline placebo. Both cohorts exhibited considerable pain reduction (median upright Visual Analogue Scale scores decreasing from approximately 74–84 mm to 26–37 mm at the 30-minute mark), with approximately 45–50% of participants avoiding EBP. The lack of significant differences between the local anesthetic and placebo groups suggests potential mechanical or non-specific effects; however, the overall pain relief and decreased utilization of EBP were clinically significant.[7]

Retrospective comparisons, such as those by Cohen et al., indicated a quicker onset of relief with the SPG block when compared to EBP, along with higher rates of notable improvement at the 30- and 60-minute intervals and a reduction in complications. One review noted that approximately 69% of patients receiving SPG block averted the need for EBP.[8] Smaller studies and case series consistently report rapid pain relief (often occurring within minutes to one hour), commendable tolerability, and avoidance of EBP among numerous obstetric and non-obstetric patients suffering from PDPH.[9] The transnasal application method has proven to be both effective and safe.

Additionally, corroborating data from observational studies, pediatric cases, and comparative analyses suggest diminished requirements for rescue analgesia, shorter hospital stays in certain contexts, and high levels of patient satisfaction. Early intervention, even within 24 hours of symptom onset, appears to confer benefits.[10] Regarding safety and the advantages of the transnasal method, adverse effects are generally mild and transient, including a bitter taste, nasal discomfort, lacrimation, and oropharyngeal numbness. Serious complications are infrequent, particularly compared with EBP. The transnasal approach is also cost-effective, repeatable, and suitable for patients who refuse or are contraindicated for EBP.[5]

There are, however, limitations to consider: the quality of evidence varies, with many studies being small in scale; some meta-analyses report very low to moderate certainty. Furthermore, long-term superiority over conservative treatments lacks consistent support, and both placebo and mechanical effects may play a role. Current guidelines from multi-society organizations do not advocate for the routine use of transnasal SPG block due to identified evidence gaps, which underline the need for larger RCTs.

## CONCLUSION:

Transnasal SPG block shows promise as a first-line treatment for PDPH, providing rapid relief and reducing the need for EBP. This method fits into a stepwise approach, starting with conservative measures, then the SPG block, and using EBP only for refractory cases. Ongoing research will help refine its role further.

**Conflict of Interest:** Sanju Regmi and Parshal Bhandari did not take part in any editorial decision.

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