REVIEW ARTICLE

Local Anesthetics for Sphenopalatine Ganglion Block in Patients Undergoing Endoscopic Septoplasty

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ABSTRACT

Keywords: Sphenopalatine ganglion nerve block; postoperative pain; lidocaine; bupivacaine.

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One of the most common consequences following endoscopic sinus surgery is postoperative discomfort. There is evidence to support the use of intranasal sphenopalatine ganglion (SPG) block to lessen the requirement for systemic analgesia. Although several therapeutic compounds have been researched, lidocaine and bupivacaine remain popular therapy alternatives due to their accessibility and affordability. Bilateral SPG block as adjuvants to general anaesthesia during endoscopic endo-nasal trans-sphenoidal hypophysectomy is a safe and successful approach. By using a bilateral SPG block regulates hypotensive method, treats insufficient intraoperative analgesia, decreases intraoperative blood loss, and improves surgical field vision, it aids to the stability of hemodynamics during surgery. Additionally, SPG block reduced the need for analgesics after surgery and has promoted a quicker recovery, which is essential for an early neurological evaluation.

INTRODUCTION

One of the procedures that otolaryngologists conduct the most commonly worldwide is endoscopic septoplasty.[1] It is estimated that 75% of individuals who have endoscopic septoplasty would feel moderate to severe pain, making up 86% of those who experience discomfort.[2] Nasal surgery requires proper post-operative pain treatment since it lowers perioperative morbidity, complications, hospital stay, and expenses.[3]

Sphenopalatine Ganglion (SPG), which is related to the brain stem and the central nervous system (CNS) and is situated in the cranial region of the autonomous nervous system, has special properties that make it useful for treating a variety of painful facial and head ailments.[4]

One of the regional anaesthetic procedures, along with general anaesthesia (GA), is sphenopalatine ganglion block (SPGB), which produces relative hypotension and a regulated heart rate and may improve the operative field for endoscopic surgery. Additionally, SPGB seems to shorten hospital stays and decrease the need for narcotics in the recovery area.[5]

Therefore; this article review discusses the effectiveness of sphenopalatine ganglion block with lidocaine and/or bupivacaine in patients undergoing endoscopic septoplasty.

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1-Sphenopalatine Ganglion Block

In 1908, Sluder coined the term "sphenopalatine neuralgia" to refer to the condition in which the sphenopalatine ganglion (SPG) plays a role in the pathophysiology of pain.[1] Sphenopalatine neuralgia as a set of unilateral face pain symptoms with corresponding motor, sensory, gustatory, and neuralgic aspects. A number of painful disorders are now treated by blocking the sphenopalatine ganglion.[2]

1-Anatomy and Physiology

The pterygopalatine fossa is home to the sphenopalatine ganglion (SPG), also known as Meckel's, the pterygopalatine ganglion (PPG), and the sphenomaxillary ganglion. It is situated behind the middle turbinate and maxillary sinus. The nasal cavity, palate, and some areas of the nasopharynx and oropharynx are all innervated by the parasympathetic, sympathetic, and sensory nerves that make up the SPG. The pharyngeal branch of the maxillary nerve, superior, inferior, and posterior lateral nasal branches, and the larger and smaller palatine nerves all originate from this ganglion. Additionally, orbital branches extend to the lacrimal gland. [18]

The harder palate, incisor teeth, and the mucosa covering the inferior nasal concha, middle meatus, and inferior and middle meatuses are all sensed via the greater palatine nerve. The mucosa of the superior and middle nasal conchae, the posterior ethmoidal air cells, and the posterior portion of the nasal septum are all sensed by the posterior superior lateral nasal nerves. The nasopalatine nerve branches inferiorly and anteriorly at the margin of the vomer, feeding the septum, and travels through the roof of the nasal cavity to the septum. [19]

The two nasopalatine nerves participate in the innervation of the upper central incisors as they descend to the palate at the incisive canal. Patients who have had septorhinoplasty may have discomfort in their upper central incisors, hard palate, osteotomy lines, and nasal cavity mucosa (owing to anterior nasal splint pressure and a sense of fullness). The potential discomfort of these places is reduced by atraumatic osteotomy and infiltrative anaesthetic of the osteotomy sites. The SPGB has the potential to block the previously described regions, hence it is anticipated to deliver postoperative analgesia following SRP. [20]

A parasympathetic extracranial ganglion in the pterygopalatine fossa, the sphenopalatine ganglion (SPG) is situated there. The pterygopalatine fossa is bounded by the following: A vertical plate of the palatine bone serves as the medial boundary, the superior border is the sphenoid sinus, the inferior border is the maxillary sinus, and the lateral border connects to the infratemporal fossa.[3]

2-Indications

A number of pain conditions have been suggested as candidates for therapy with the sphenopalatine ganglion block.[4]

(1a) A thorough analysis of randomised controlled studies (1b) A single, carefully conducted randomised controlled experiment with a small confidence interval (2a) Continual evaluation and meta-analysis of cohort studies (2b) Single low-quality cohort studies or randomised control studies(3a); systematic reviews/meta-analyses of case-control studies(3b); single case-control studies (4); and low-quality case series (5) seasoned judgement.[5]

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These are the recommendations' grades: Level 1 studies with consistent findings (A), derivation from level 1 studies (B), level 2 or 3 studies with consistent findings (C), level 4 studies (D), or inconclusive/inconsistent findings in the literature (E). [6]

Technique

It is possible to execute a transnasal, transoral, or transcutaneous sphenopalatine ganglion block.[7]

Since many years ago, SPGB has been utilised to treat a variety of painful head and face diseases. 10 The signs of SPGB have grown over time. Trigeminal neuralgia, atypical facial pain, acute migraine, acute and chronic cluster headache, herpes zoster affecting the ophthalmic nerve, and a range of other headache conditions are among the indications for the SPGB. [21]

There are several ways to create SPGB, from minimally invasive to extremely so. The procedures for SPGB include using topical anaesthetics transnasally with a cotton-tipped applicator, transoral approach with a curved dental needle, lateral approach with a straight needle via the infratemporal fossa, and more recently employing noninvasive transnasal devices. A topical anaesthetic blocking agent can be administered to the region of mucosa connected to the SPG via the transnasal SPGB approach. This method is predicated on the notion that the mucosa around the SPG should receive topical anaesthesia. For this method, a few intranasal devices have been created. **[22]**

Using tactile perception to ensure adequate insertion, the sheath of the device is placed into the nasal tube above the middle turbinate. In order to administer the topical anaesthetic via the SPG, we employed a mucosal atomi- zation device. The gadget was precisely inserted via the posterior and across the middle turbinate tail using a transnasal endoscopic technique. The gadget may be placed more precisely by using the endoscopic technique. The easiest and most acceptable method for SPGB is to apply topical anaesthetic intranasally. **[23]**

SPGB can be carried out using a range of pharmacological substances. Lidocaine, bupivacaine, cocaine, phenol, alcohol, and depot steroids are some of these substances. To produce SPGB in this trial, a solution of 4% lidocaine and 8 mg dexamethasone was delivered. **[24]**

For the treatment of POP following functional endoscopic sinus surgery, SPGB has been utilised extensively (ESS). In a recent study, it was discovered that the SPGB effectively decreased the POP and the quantities of analgesics needed by ESS patients in the postoperative phase. 15 Visual analogue scale (VAS) ratings in the intervention group were considerably lower than in the control group at the first 24 hours following the ESS, according to another research that used bupivacaine for the SPGB. However, there were no appreciable variations in VAS at 48 hours, 7 days, or 21 days across the groups. In another trial, it was discovered that an injection of 2% lidocaine and 1:100,000 epinephrine reduced POP at the block group within the first 24 hours following the ESS. [25]

According to rumours, the SPGB is not resilient and the topical anaesthetic diffusion to the SPG is uncertain. The first 24 hours following surgery were only included in the follow-up data for our study, therefore the long-term implications of this approach are unknown. To fully understand the long-term impacts of this method, more research is required. **[26]**

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Local Anesthetics for Sphenopalatine Ganglion Block in Patients Undergoing Endoscopic Septoplasty

During and after procedures that use local anaesthetics, the patient's comfort is crucial. Postoperative discomfort is the main complaint. In otolaryngology clinics, septoplasty under local anaesthetic is a regular treatment. An effect of surgical trauma and the expression of pain mediators is postoperative pain. [8]

The first 24 hours following a septoplasty are often when patients have the most discomfort and need analgesic treatment. The anxiety brought on by pain is reduced when it doesn't develop during this time, preventing the start of a vicious cycle. The most often used local anaesthetic is lidocaine. Because it has a short half-life and acts quickly, it cannot effectively block postoperative pain for an extended period of time.[9]

Patients who underwent surgery using the long-lasting local anaesthetic levo-bupiva-caine should experience postoperative pain later than those who underwent surgery using lidocaine, require analgesic support later, and require comparatively less analgesics. This hypothesis was supported by a comparison of the levels of postoperative pain and need for postoperative analgesia experienced by patients undergoing septoplasty surgery with levo-bupivacaine, a long-lasting anaesthetic, and patients undergoing septoplasty surgery with lidocaine, a short-lived infiltrative anaesthetic. **[10]**

Adults undergoing a septoplasty procedure under local anaesthetic is a common procedure in otolaryngology clinics. Postoperative discomfort following surgical treatments utilizing local anaesthetics continues to be a significant issue for many surgeons. Low levels of postoperative pain can hasten recovery, which will improve patient comfort and cut down on missed work time.[11]

This theoretical understanding was validated by the levo-bupiva-caine group's lower VAS ratings throughout the first four hours. After six hours, the levo-bupivacaine group's VAS ratings were significantly lower than those of the lidocaine group. However, there was no statistically significant difference. The VAS scores of the levo-bupivacaine group, however, remained lower at the conclusion of the 24th hour, which may indicate the drug's ability to break up the pain cycle.[12]

There aren't many trials on long-lasting medications as an alternative to lidocaine in the literature. Levo-bupivacaine is a secure and long-lasting anaesthetic agent; however, no research has been done to date to examine the length of anaesthesia and the quantity of postoperative analgesics utilised after septoplasty with any other long-lasting anaesthetic agent. We are therefore the first to compare these features of two anaesthetics in our study. **[13]**

For postoperative discomfort following endoscopic sinus surgery, Friedman et al. compared levo-bupivacaine with lidocaine. But unlike our study, they found no discernible changes between the two groups. Similar results were obtained by Apostolopoulos et al. when they compared the effects of ropivacaine, a long-lasting local anaesthetic, and lidocaine in patients undergoing tonsillectomy. They discovered that ropivacaine-treated patients experienced longer postoperative anaesthesia and needed less postoperative pain medication. [14]

Patients typically seek analgesics for pain treatment during this time due to the intensity of the first six hours post-operatively. It was anticipated that patients will take less analgesics as a result of the interruption of the pain cycle caused by long-lasting anaesthetic drugs. Comparatively fewer analgesics were consumed by the levo-bupivacaine group than by the lidocaine group. This

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might be seen as a sign that the patients in the levo-bupivacaine group experienced a more comfortable postoperative period.[15]

Impact of Sphenopalatine Ganglion Block on Patients Undergoing Septorhinoplasty's Postoperative Pain

One of the operations frequently performed by otolaryngologists and plastic surgeons is septorhinoplasty (SRP). Even minor postoperative discomfort might increase patient dissatisfaction with the procedure. The need for pain control within the first 24 hours following SRP has been mentioned in prior research. Although SRP is one of the most prevalent surgical procedures, little research has been done on the frequency and intensity of postoperative pain (POP) in SRP patients. Many forms of acute and chronic facial discomfort, as well as headaches, are commonly treated with the sphenopala-tine ganglion block (SPGB). There are several ways to do this operation. This study sought to determine the impact of preoperative SPBG on the POP in patients undergoing SRP. The administration of SPBG utilising noninvasive transnasal devices is a simple and safe procedure. **[16]**

According to the findings, transnasal SPBG is a useful method for minimising discomfort and the requirement for rescue analgesics during the first 24 hours following surgery. Nonsteroidal anti-inflammatory medicines (NSAIDs) are a possibility to lower POP following the SRP, however these medications have side effects, including gastrointestinal, neurological, and haematological adverse effects that may result in postoperative haemorrhage. 8 Systemic opioids can also be used to lower POP, but their clinical usage is constrained due to their adverse effects, which include drowsiness, ileus, respiratory depression, nausea, vomiting, and urine retention.[17]

CONCLUSION

General anaesthesia (GA) and sphenopalatine ganglion block (SPGB) are two localized anaesthetic methods used to lessen the requirement for systemic analgesia. In addition to increasing patient satisfaction in pain management following nose surgery, SPGB is anticipated to offer preoperative and postoperative analgesia.

Endoscopic SPGB is related to less postoperative pain and greater satisfaction with pain management following surgery. Bupivacaine works well to relieve postoperative pain after septoplasty under local anaesthetic. By lowering pain levels in comparison to lidocaine, it improves patients' postoperative comfort. Further research with long period of follow-up.

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