Sphenopalatine ganglion block injections for headache

Clinical Policy ID: CCP.1253

Recent review date: 5/2025

Next review date: 9/2026

Policy contains: Bupivacaine, botulinum toxin, cluster headache, migraine headache, trigeminal neuralgia, sphenopalatine ganglion block.

Coverage policy

Sphenopalatine ganglion block injections for headache are investigational/not clinically proven and, therefore, not medically necessary.

Limitations

No limitations were identified during the writing of this policy.

Alternative covered services

- Sphenopalatine ganglion block neuro-stimulation.
- Sphenopalatine ganglion block radiofrequency ablation.

Background

The sphenopalatine ganglion is an autonomic mass of nerve cell bodies found in the pterygopalatine fossa (trench) in the skull, just behind the nose. The nerve cells are linked to the trigeminal nerve, the main nerve involved in headache, and thus the sphenopalatine ganglion has been the target of numerous treatments to block the source(s) of pain in patients with chronic headaches (Alexander, 2022). Sphenopalatine ganglion

neuromodulation has been used to treat a variety of head pain disorders such as (Giaccari, 2021):

- Cluster headaches.
- Migraine headaches.
- Post-dural puncture headaches.
- Trigeminal neuralgia.
- Herpes zoster.
- Paroxysmal hemicrania.
- Cancer of the head and neck.
- Atypical facial pain.
- Complex regional pain syndrome.
- Temporomandibular disorder.
- Nasal contact point headache.
- Vasomotor rhinitis.

A sphenopalatine ganglion block involves administering a local anesthetic into the sphenopalatine ganglion located behind the nasal cavity. It can be performed through transnasal, transoral, or transcutaneous approaches. The earliest treatments involved applying topical numbing medications on cotton swabs to the back of the nose. Another technique involves injecting patients transcutaneously through an area on the cheek, using alcohol. Relatively recently, three transnasal catheters became available to facilitate transnasal application in and around the sphenopalatine ganglion. They are Spheno Cath® (Dolor Technologies, LLC, Syracuse, Utah), Allevio® (CureMed Nordic, Gothenburg, Sweden), and Tx 360® (Tian Medical, Libertyville, Illinois). Anesthetics used in a sphenopalatine ganglion block to control head pain include bupivacaine and lidocaine (Alexander, 2022).

Adverse effects of a sphenopalatine ganglion block are typically minor and consist of 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 and local or retroorbital hematoma (Alexander, 2022).

Findings

Guidelines

A position statement from the European Headache Foundation recommends sphenopalatine palatine block stimulation before deep brain stimulation in chronic cluster headaches (Martilletti, 2013), as does the American Headache Society which gave a Level B recommendation for acute treatment (for cluster headache) using sphenopalatine ganglion block stimulation (Robbins, 2016). However, neither of these, nor other guidelines, addresses sphenopalatine ganglion block injections for headache, including an American Academy of Neurology/American Headache Society 2019 guideline for treating migraines in children and adolescents (Oskoui, 2019).

The American Academy of Pain Medicine issued a weak recommendation for occipital nerve block with sphenopalatine block injections as a means of preventing migraine headaches. The recommendation was based on the safety and efficacy results of one small randomized controlled trial, considered low certainty evidence (Barad, 2022).

A Department of Veterans Affairs/Department of Defense clinical practice guideline found insufficient evidence to recommend for or against sphenopalatine ganglion block for the treatment of chronic migraine (Sico, 2024).

A multidisciplinary, international consensus guideline found insufficient evidence to recommend the routine use

of sphenopalatine ganglion blocks (using a bilateral, intranasal approach) to treat postdural puncture headache (grade I; low level of certainty) (Uppal, 2024).

Evidence review

Despite the clearly delineated targeted area and resultant effectiveness of pain relief when blocked; the optimal blocking method/technique has yet to be determined. Clinicians have developed invasive as well as non-invasive techniques, but each one demonstrates varying rates and duration of pain reduction. While sphenopalatine ganglion block injections have shown some promise in reducing pain for chronic headache sufferers and patients with other conditions, the evidence is limited, and more studies are needed to better assess the efficacy of this technology (Mojica, 2017).

For various head pain conditions, positive effects were generally small and based on very few studies but of short duration, as repetitive block procedures may be needed. Lidocaine and bupivacaine were the most common anesthetics used alone or in combination with medications such as epinephrine, triamcinolone, and dexamethasone. Some studies used imaging guidance for needle placement. Side effects are typically local with numbness and stinging at the root of the nose and palate, numbness or lacrimation of ipsilateral eye, and bitter taste and numbness of the throat. There is also the risk of bleeding, infection, and epistaxis with needle injection techniques (Ho, 2017).

The highest level of evidence supported sphenopalatine ganglion block for reducing the need for analgesics after endoscopic sinus surgery using needle injection with a transnasal and palatal approach (grade 1B, six individual randomized controlled trials with narrow confidence interval). There was one individual cohort study or low-quality randomized controlled trial (grade 2B) supporting each of the following conditions: cluster headache using a topic swab; second-division trigeminal neuralgia using lidocaine spray; and migraine using the Tx360 transnasal catheter. There was one individual case-control study (grade 3B) supporting a reduction in pain associated with removal of nasal packing after surgery. All received B level recommendations reflecting support from consistent level 2 or 3 studies or extrapolations from level 1 studies. Head-to-head comparative studies are needed to compare the efficacy among different blocking strategies (Ho, 2017).

Subsequent systematic reviews by Rosso (2019) and Sanchez-Gomez (2021) confirm these findings for sphenopalatine ganglion treatments for cluster headaches. A systematic review of three studies, each between 10 and 17 subjects with cluster headaches, examined the use of botulinum toxin for the treatment of cluster headache. Each study found significant improvement in headache frequency as early as one week after treatment, but also found injections into the sphenopalatine ganglion may have an elevated rate of adverse events (Freund, 2020).

A review of 489 sphenoganglion blocks performed between 2015 – 2018 on patients age six – 26 years with migraine headache or status migrainosus found 100% technical success with significantly reduced average pain scores ($P < .0001$). Authors reported no immediate or acute complications and supported the treatment in refractory pediatric migraines to reduce intravenous medications, prolonged pain control, or hospital admission (Mousa, 2021).

Three systematic reviews examined sphenopalatine ganglion block for treating postdural puncture headaches. Giaccari (2021) found that of the 97 participants given sphenopalatine nerve block injections, most experience relief (71.4%, 85.7%, and 92.9% within 1, 24, and 48 hours), with no adverse effects. In the Alatni (2024) review, one randomized clinical trial (n = 93) found sphenopalatine ganglion block equally effective as greater occipital nerve block, with both being less invasive and safer than epidural blood patch, but another trial (n = 40) found no significant difference between sphenopalatine ganglion block and placebo.

A meta-analysis of nine randomized controlled trials (n= 381) found sphenopalatine ganglion block superior to conservative treatment (six studies) in reducing pain scores at various time points up to four hours after

intervention and resulted in fewer treatment failures. Sphenopalatine ganglion block was also superior to intranasal lidocaine puffs (one study) for pain reduction up to 24 hours, but there was insufficient evidence to determine the efficacy of sphenopalatine ganglion block compared to sham block or greater occipital nerve block (Dwivedi, 2023). Overall, the evidence suggests sphenopalatine ganglion block may be a promising, minimally-invasive treatment option for postdural puncture headache, but larger, high quality trials are needed to firmly establish its efficacy.

In 2024, we updated the references which warranted no policy changes.

In 2025, we updated the references which warranted no policy changes.

References

On March 12, 2025, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were “headache disorders” (MeSH), “sphenopalatine ganglion,” “Meckel's ganglion,” “nasal ganglion,” “sphenopalatine ganglion injection,” and “sphenopalatine ganglion block injection.” We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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Policy updates

7/2016: initial review date and clinical policy effective date: 10/2016

6/2017: Policy references updated.

5/2018: Policy references updated.

6/2019: Policy references updated. Policy Name changed to CCP.1253.

5/2020: We did not identify any new relevant publications.

5/2021: Policy references updated.

5/2022: Policy references updated.

5/2023: Policy references updated.

5/2024: Policy references updated.

5/2025: Policy references updated.