

Treatment of unexplained facial numbness with stellate ganglion blockade: A case report

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Abstract

To date, there is no established treatment of facial numbness or dysaesthesia of unspecified causes. Herein, we report a case of unexplained facial numbness and confirmed hypaesthesia that achieved clinical response to stellate ganglion blockade (SGB). SGB might be an effective treatment of psychological-stress-related facial numbness of unknown origin.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest associated with this manuscript.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article, as no datasets were generated or analyzed during the current study.

ETHICAL APPROVAL

Written informed consent was obtained from the patient for publication of this case report. This case report was approved by the Institutional Ethics Committee (No.868) of the Kanagawa Dental University in accordance with the Declaration of Helsinki. This report is presented in accordance with the CARE guidelines established by the EQUATOR network.

CONSENT

This article does not contain any data that could be used to identify individual participants. In addition, patient consent has been obtained for the release of data.

Key clinical message: We describe a 50-year-old man with facial numbness of unknown aetiology. To date, there is no specific treatment of facial numbness or dysaesthesia of unknown origin. We successfully treated the patient with stellate ganglion blockade (SGB). The patient achieved clinical response to SGB.

Abstract

To date, there is no established treatment of facial numbness or dysaesthesia of unspecified causes. Herein, we report a case of unexplained facial numbness and confirmed hypaesthesia that achieved clinical response to stellate ganglion blockade (SGB). SGB might be an effective treatment of psychological-stress-related facial numbness of unknown origin.

KEYWORDS : stellate ganglion blockade, numbness, dysaesthesia, hypaesthesia

INTRODUCTION

Numbness and sensory disturbances of the face due to peripheral neuropathy caused by tumors, inflammation, or surgical nerve damage can be easily diagnosed.¹ An approach to managing primary disease was chosen as a treatment strategy. Stellate ganglion blockade (SGB) is often the treatment of choice for paraesthesia due to nerve damage. However, there is no established treatment of numbness or dysaesthesia of undetermined origin. Herein, we report a case of clinical improvement after SGB sessions in a patient with unexplained facial numbness and confirmed hypaesthesia.

CASE REPORT

Patient Information

A 50-year-old man presented with numbness in the skin of the upper lip around the right anterior maxillary teeth, and area from around the eye to the cheekbone. This numbness persisted for a month. The patient had unremarkable medical history. The patient was referred to our department for an evaluation of these unexplained symptoms.

Clinical Findings

At the first visit to our department, we performed the Semmes-Weinstein monofilament test (SWMT), a noninvasive method of measuring tactile perception thresholds by monofilaments. This test revealed a threshold of 0.28 g on the right upper lip (Figure 1, 1-1) and 0.014 g on the right lateral nasal wing skin (Figure 1, 1-3). The thresholds of the healthy contralateral areas (Figure 1, 1-2 and 1-4) were both 0.008 g. The scores of the Japanese version of the Hospital Anxiety and Depression Scale (HADS)² that was used to assess anxiety (HADS-A) and depression (HADS-D) were 9 and 6, respectively. No complaints of pain were reported.

Timeline

The timeline is shown in Figure 1.

Diagnostic Assessment

The patient was diagnosed with trigeminal neuropathy of the second branch of the right trigeminal nerve and right-sided maxillary hypaesthesia. Therefore, a right-sided SGB was performed.

Therapeutic Intervention

The treatment course included a right-sided SGB using 5 mL of mepivacaine (1%) for this trigeminal neuropathy. SGB was performed once a week at which the three main signs of Horner's syndrome (ptosis, pupil contraction, and ocular depression) were observed.

Follow-up and Outcomes

Two months after the first visit, the threshold of the skin of the right upper lip and the right lateral nasal wing was 0.02 g according to the SWMT. After six sessions of SGB, the healthy contralateral areas showed an improvement in the upper lip and lateral nasal wing of 0.014 g and 0.008 g, respectively. After eight sessions of SGB, numbness improved, as a subjective symptom. Since discomfort during eating disappeared, the treatment was terminated. HADS-A remained unchanged at 9 points. HADS-D decreased to 3 points.

DISCUSSION

By temporarily blocking the sympathetic nervous system, SGB causes dilation of the internal carotid and vertebral arteries, which run through the brain and spinal cord. The resulting increase in blood flow not only improves pain associated with local circulatory disturbances (ischemia), but also has a positive effect on hypothalamic function, thereby promoting neural recovery. SGB is used for treatment of migraine, upper limb pain, and atypical facial pain.³ Since SGB is used for treatment of many systemic diseases, including those of the immune and endocrine systems, it has a wider range of indications in Japan than in Europe or the United States.⁴

Trigeminal neuropathy is a general term for a condition in which the trigeminal nerve becomes dysfunctional due to trauma, tumors, infectious or demyelinating diseases. Trigeminal neuropathy results in sensory abnormalities, with or without pain.⁵ In the present case, there was no pain at the time of initial examination. However, sensory abnormalities were observed, leading to a diagnosis of trigeminal neuropathy.

Although there is no established treatment of unexplained paraesthesia and numbness, SGB was effective in this case in which SWMT showed improvement in the threshold. There are a few reports on the treatment of unexplained paraesthesia. The mechanism of the therapeutic effect of SGB in this case may be similar to that of SGB on complex regional pain syndrome and post-traumatic stress disorder. Nerve growth factor (NGF) increases in response to acute or chronic stress. It promotes growth of the sympathetic nerve endings and increases noradrenaline levels in the brain. SGB exerts a therapeutic effect by reducing the levels of NGF and noradrenaline.^{3,6} Acupuncture treatment could alter the secretion patterns of noradrenaline, gamma aminobutyric acid, and serotonin.⁶ Furthermore, increased sympathetic tone could reduce the function and sensitivity of pinealocytes, attenuating melatonin rhythms and causing various diseases. However, the mechanism of action of SGB comprises sympathetic inhibition within the innervated area, causing vasodilation. This not only increases blood flow, but also triggers restoration of melatonin secretion by the pineal gland, normalizing the physiological melatonin rhythms.⁴ Regarding treatment of stress-related illnesses, mindfulness may be effective in reducing stress by decreasing sympathetic activity and increasing parasympathetic activity.⁷ SGB induces a parasympathetic-dominant state, which is characterised by peripheral blood vessel dilation, increases in blood flow and respiratory rate, and a decrease in heart rate. In the present case, deep sleep and reduced heart rate were also observed after each SGB session, indicating a relaxing effect due to sympathetic suppression.

In this case, although there was no apparent aetiology of numbness, there was a change in the work environment due to the COVID-19 pandemic restrictions. The onset of numbness occurred in a more stressful situation than before. The post-SGB HADS assessment showed improvement in the depression rating scale. In addition, numbness could be a symptom of somatisation disorder or depression.⁸ Therefore, it is possible that numbness in this case may have developed due to psychological factors.

CONCLUSION

A decrease in heart rate and deep sleep after SGB showed a relaxing effect due to sympathetic suppression and an improvement in depression rating scale. These results suggest that SGB might be effective in the treatment of facial numbness related to mental stress.

AUTHOR CONTRIBUTIONS

Uno Imaizumi conceived the idea and drafted initial manuscript. Satoshi Beppu and Takuro Sanuki held discussions and provided additional input. All authors read and approved the final manuscript.

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Figure_1..pptx available at <https://authorea.com/users/503690/articles/583322-treatment-of-unexplained-facial- numbness-with-stellate-ganglion-blockade-a-case-report>