

Ultrasound-guided superficial cervical plexus block for post-herpetic neuralgia: narrative review of the literature and an illustrative case

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Abstract: *Introduction:* Post-herpetic neuralgia (PHN) is a common complication of reactivation of the varicella zoster virus. Treatment of PHN is often challenging with a myriad of medical and interventional treatments.

We describe a patient with chronic facial PHN successfully treated with a single ultrasound-guided superficial cervical plexus block (SCPB) with local anaesthetics and corticosteroids.

Case report: A 47-year-old woman presented with an intense PHN (NRS 8/10) on the left side of the face, ear and neck and concomitant symptoms of tinnitus and feeling of ear congestion for 1 year. Treatment attempts consisting of antibiotics, NSAIDs, nasal corticosteroids, physiotherapy, sertraline, lidocaine 5% patch and cervical facet injections proved to be inadequate.

Interventional treatment: After informed consent, ultrasound was used to inject 4 mL of ropivacaine 0.75% and 40 mg of methylprednisolon superficial to the deep cervical fascia and provided anesthesia of the anterior lateral neck, pre and retro auricular area and the clavicular area.

Results: A complete relief of symptoms was obtained for 2 weeks. After 6 weeks still 70% of symptoms subsided. Further treatment was not required. Treatment effect still persisted after 2 years (NRS1-2/10).

Conclusion: SCPB using ultrasound with local anesthetics and corticosteroids can be considered for facial PHN.

Keywords: Neuralgia; postherpetic; cervical plexus block; case report.

INTRODUCTION

Varicella zoster virus (VZV) infection causes 2 clinically distinct diseases. Primary infection with VZV results in varicella (chickenpox), which is characterized by vesicular lesions on an erythematous base, mostly concentrated on the face and trunk. Herpes zoster (HZ), also known as shingles, results from reactivation of latent VZV that gained access to sensory ganglia during primary infection. As cellular immunity wanes with age or immunocompromise, the VZV is transported along peripheral nerves, producing acute neuritis. HZ is characterized by a painful, unilateral vesicular eruption, which usually occurs

in a restricted dermatomal distribution (1). Patients describe burning pain, tingling, itchiness or changes in sensation. Symptoms include malaise, fever and headache. The lifetime risk of developing HZ is between 25% and 30%, rising to 50% in the elderly above 80 years (2).

According to the duration, HZ is divided into 3 phases:³

– Acute herpetic neuralgia refers to pain preceding or accompanying the eruption of the rash and persists up to 30 days from onset of pain. Initially, the rash is erythematous and maculopapular, later on it develops to take on the form of clusters of clear vesicles.

– Subacute herpetic neuralgia refers to pain that persists after healing of the rash but which resolves within 4 months after onset.

– Post-herpetic neuralgia (PHN) refers to pain persisting longer than 4 months from onset of the rash.

Acute herpetic neuralgia is probably produced by both the inflammation associated with the movement of VZV from sensory nerves to skin and subcutaneous tissues, and by the inflammatory damage to peripheral nerve, dorsal root and dorsal root ganglion. In addition, tissue damage in afferent neurons causes changes in the dorsal horn neurons, sensitizing them to further input and resulting in spontaneous activity capable of maintaining pain in the absence of primary insult. This response may explain the persistence of the pain of PHN (4, 5).

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he development of PHN occurs in 9–19% of all HZ patients (6, 7). PHN can last for several months or even years. Old age and ophthalmic localization are risk factors for developing PHN. PHN has a high impact on the activities of daily living (ADL) and is often challenging to treat (4, 2).

We present a case report of PHN successfully treated by ultrasound-guided superficial cervical plexus block with injection of local anesthetic and corticosteroids.

CASE REPORT

A 47-year-old woman with no medical history consulted her general physician with an inflammation of the left ear with a retro-auricular skin lesion and neck pain for 1 week. Other symptoms included tinnitus, nasal congestion and mild hearing loss. The initial diagnosis of erysipelas was made and antibiotics, NSAIDs and a nasal corticosteroid spray were prescribed.

She was referred to an ENT-specialist for a second opinion due to intolerable pain 1 week later. The inflammation of the left ear had settled except for 2 minor lesions in the external ear canal with an otherwise normal eardrum. However, she experienced allodynia of the ear and the temporal side of the skull. Audiometry detected a mild hearing loss for high tones on the left side. The diagnose of acute herpetic neuralgia was made and a peroral corticosteroids tapering scheme was prescribed for 2 weeks.

In the subacute herpetic phase 1 month later, clinical examination was normal and audiometry detected a nearly normal perceptive hearing function. MRI showed no vestibular neuritis. Meanwhile she still experienced tinnitus, allodynia and numbness of the left earlobe. Corticosteroids were continued.

A second ENT specialist was contacted 4 months later because the pain persisted. She had auricular and mandibular allodynia and an audiometry painful at 8 kHz and triggering tinnitus at 1 kHz. The diagnosis of PHN was made and sertraline was prescribed. Physiotherapy was started due to secondary neck strain.

One year after the start of the symptoms the patient was referred to a multidisciplinary pain clinic. Patient presented with left facial pain extending retro auricular and to the left side of the neck. She mentioned paresthesia on the left side of the face. On clinical examination there was numbness and facet joint tenderness. She still experienced tinnitus, subjective hearing loss and hypersensitivity to loud sounds.

In the last 6 months her pain score was unchanged. On a numeric rating scale (NRS) she had a score of 5/10 with exacerbations to 8/10 with high impact on ADL and mental health.

Initial treatment with lidocaine patch 5% (Versatis®) was preferred because of its safety profile but was inadequate to control the symptoms. Diagnostic cervical medial branch block of facet C2-C5 with local anesthetics showed no pathology of facet joints.

After informed consent an ultrasound-guided SCPB was performed. The patient was positioned in dorsal decubitus and ECG, blood pressure and oxygen saturation were monitored. Verbal and visual contact was maintained during the procedure. Using ultrasound, the left superficial cervical plexus was visualized just lateral to the sternocleidomastoid muscle (SCM). Four mL of ropivacaine 0.75% and 40 mg methylprednisolon (Depo-Medrol®) was injected in fractions using injection pressure monitoring (B-Smart®). It was injected superficially to the deep cervical fascia under direct ultrasound visualisation. This provided sensory loss of the anterior lateral neck, pre and retro auricular area and the clavicular area. Patient was dismissed after 1 hour without complications. For 2 weeks following the procedure she had no pain. After 2 weeks she still experienced a global perceived effect of 70% with NRS 2-3/10. Facial sensation was still different. Further treatment was not necessary.

After 2 years the patient was contacted for publication consent: NRS was 1-2/10 without treatment.

DISCUSSION

Postherpetic neuralgia (PHN) can have a big impact on ADL and quality of life due to negative effects on physical, social, functional and psychological health (2).

Gabapentin, pregabalin, and tricyclic antidepressants (TCA) are generally the drugs of first choice for the treatment of PHN (3). Topical capsaicin or lidocaine may provide (short-)term pain relief.

When reviewing the literature, multiple interventional treatments with different injectables or ways of neuronal stimulation were studied, targeting different locations of the pain pathway. Rigorous evidence is lacking that these are beneficial in the treatment of PHN but if safe and discussed with the patient they can be considered when medical treatment is inadequate (8).

Due to the growing expertise in the use of ultrasound, the use of peripheral nerve blocks for HZ and PHN seems tempting as these can safely be performed in an ambulatory setting. However data is solely based on case reports (9).

We found 3 case reports using SCPB for the acute phase of HZ in the literature. To date no case reports describing SCPB for treatment of PHN were found.

– A 71-year-old woman with a diagnosed herpetic rash on her right cervical 2-4 dermatomes was initially treated with famciclovir 250 mg 3 times a day for 7 days, pregabalin 150 mg 2 times a day and tramadol 150 mg once a day for 14 days. Despite this medication the patient still experienced pain (NRS 6-10/10) and heavy itching. A cervical epidural infiltration was discussed but refused. Sixteen days after onset of HZ an ultrasound guided SCPB was performed using 15 mL lidocaine 0.5% and triamcinolone 30 mg. The tip of the needle was placed behind the posterior border of the SCM. Her pain and itching completely disappeared 5 days after the procedure. She remained symptom-free after 6 months follow-up (10).

– A 50-year-old man was diagnosed with acute HZ with crust formation on the left C3-C4 dermatomes. Pregabalin 300 mg/day, celecoxib 200 mg/day, nortriptyline 10 mg/day and famciclovir 250 mg/day were prescribed. A cervical epidural infiltration was considered 10 days after the onset of the rash. Instead, 2 SCPB were performed using 20 mL lidocaine 0.5% with Triamcinolone 20 mg with a two-week interval. One month after the first SCPB, pain and itching was reduced from 7 to 3 on the visual analogue scale. Medication was reduced, but pregabalin 150 mg/day remained necessary due to bothersome symptoms of PHN after 7 months. As such the SCPB could not prevent PHN but the authors concluded an effect in the acute phase (11).

– A 65-year-old man was hospitalized with severe auricular pain (NRS 6/10) for 12 days. He had an erythematous maculopapular rash in the left C3 dermatome for 2 days. Medication including NSAIDs, gabapentin 600 mg/day, amitriptyline 10 mg/day, EMLA cream and antibiotics were administered. An intravenous patient-controlled analgesia (PCA) with fentanyl was started and a series of 6 stellate ganglion blocks were performed with intervals of 2 or 3 days. Because of refractory intermittent neuralgia an ultrasound guided SCPB injecting 6 mL ropivacaine 0.125% and 10 mg triamcinolone acetonide was performed, quickly resolving the throbbing and shooting neuralgia and reducing pain to a NRS 3/10 (12).

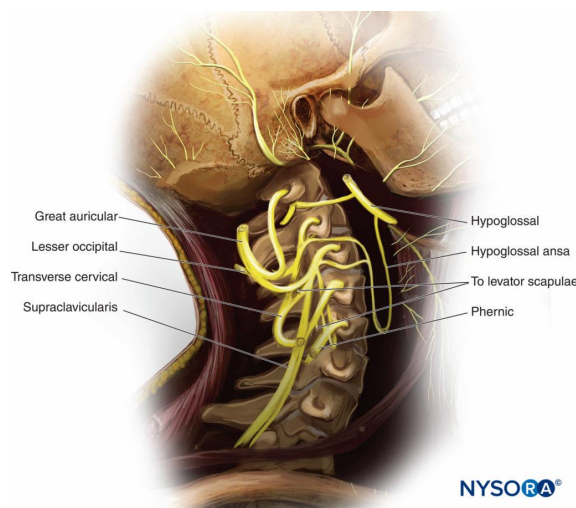


Fig. 1. — Anatomy of the deep cervical plexus and its main branches and anastomoses. (Source: NYSORA.COM).

The cervical plexus originates from the anterior rami of C1 to C4. The motor branches include the ansa cervicalis and there are branches that innervate many cervical muscles (m. scalenus medius, m. levator scapulae) and the diaphragm. The cervical plexus forms 4 superficial sensory branches: the lesser occipital (C2-3), greater auricular (C2-3), transverse cervical (C2-3) and the supraclavicular nerve (C3-4) (Fig 1).

The sensory branches emerge at the posterior border of the SCM and innervate their respective superficial endpoints including the skin and subcutaneous tissues of anterior lateral neck, pre and retro auricular area and the clavicular area (Fig. 2).

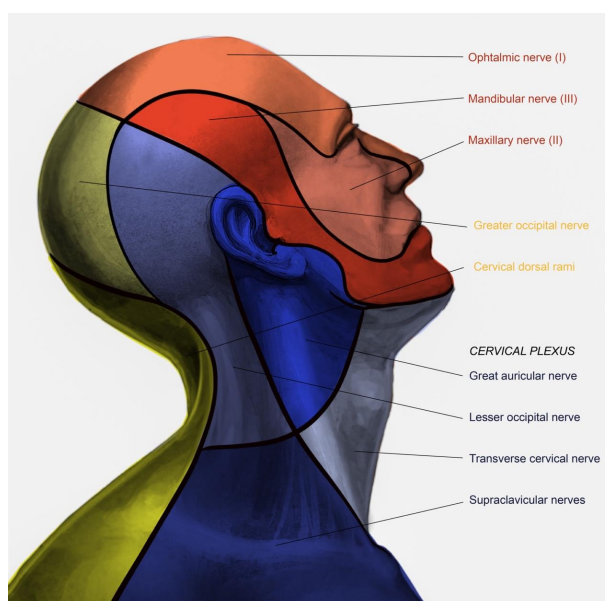


Fig. 2. — Innervation of the head and neck. (Source: NYSORA.COM).

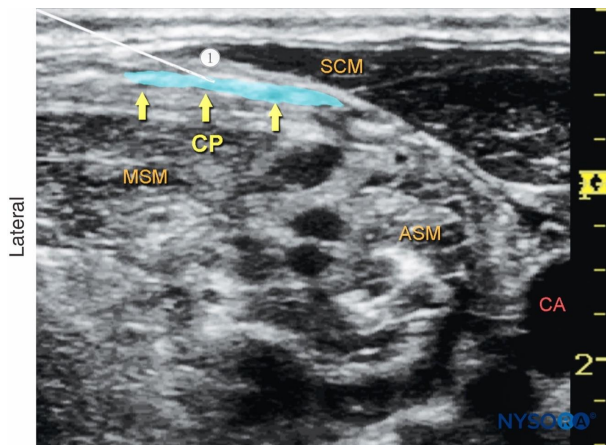


Fig. 3. — Cervical plexus (transverse view): desired distribution of local anesthetic (blue-shaded area) to block the cervical plexus. Needle path: 1. ASM, anterior scalene muscle; CA, carotid artery; CP, cervical plexus; MSM, middle scalene muscle; SCM, sternocleidomastoid muscle. (Source: NYSORA.COM).

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Various techniques of cervical plexus blocks have been evaluated for carotid endarterectomy.

A superficial plexus block is conventionally described as a subcutaneous injection technique performed at the mid-portion of the posterior border of the SCM muscle targeting the superficial branches (Fig 3.). This in contrast to a deep cervical plexus block which is described as a paravertebral block targeting the C2-C4 spinal nerves (13).

Ultrasound superficial cervical plexus block has been proven to be an easy and safe technique for anesthesia for carotid endarterectomy, superficial surgery of the neck and thyroid surgery (13).

These case reports suggest the use of SCPB as a treatment option for refractory herpes zoster. RCT are required to validate the efficacy and safety of ultrasound-guided nerve block in the treatment of PHN.

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