

# Brief Communication

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## Regional Head and Face Pain Relief Following Lower Cervical Intramuscular Anesthetic Injection

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**Background.**—Although cervical trigger point intramuscular injections are commonly used to relieve localized neck pain, regional head pain relief from lower cervical paravertebral injections has not been reported previously.

**Purpose.**—To evaluate the safety and efficacy of such injections in a selected group of patients with intractable head or face pain.

**Methods.**—In a series of patients with chronic head or face pain, local anesthetic was injected into the lower cervical spine paravertebral musculature approximately 1 to 2 inches lateral to the seventh cervical spinous process.

**Results.**—In addition to producing rapid relief of palpable scalp or facial tenderness (mechanical hyperalgesia and allodynia pain), this lower cervical intramuscular injection technique alleviated associated symptoms of nausea, photophobia, and phonophobia in patients with migrainous headache.

**Conclusion.**—Our results suggest that lower cervical intramuscular anesthetic injection may be an effective treatment for head or face pain.

**Key words:** migraine, headache, cephalgia, IHS classification, trigeminovascular system, cervical injection, neurovascular headache, facial pain, postherpetic neuralgia, trigeminal neuralgia

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Effective treatment for head, face, and neck pain can be difficult to obtain. We describe a series of patients whose head, face, or neck pain was reduced significantly following the injection of anesthetic into the lower cervical spine paravertebral musculature approximately 1 to 2 inches lateral to the seventh cervical spinous process.

Pain relief presumably results from the treatment's effect on a central pain-modulating mechanism that most likely involves the trigeminovascular system and spinal pathways.

The procedure described in this series is similar to a myofascial "trigger point" injection. After a sterile field is prepared over the lower cervical and upper thoracic dorsal spine, 0.5 to 1.5 mL of 0.25% or 0.5% bupivacaine hydrochloride is injected using a 1.5-inch

25-gauge needle. The needle is inserted at least 1 inch into the paravertebral spinal musculature 1-inch lateral to the lower cervical spinous processes. In the majority of patients presented in this report, methylprednisolone acetate was also administered. Injection of methylprednisolone or other preferred corticosteroid can be used with bupivacaine according to clinical preference.

### CASE HISTORIES

**Migraine.**—*Case 1.*—A 29-year-old woman presented with a 4-year history of frequent migraine. She reported 2 types of headache that were described as severe and less severe. The more severe headache occurred 2 to 3 times per week and involved a severe throbbing pain with associated nausea, vomiting, photophobia, and phonophobia. These headaches typically responded to triptan therapy, as needed.

She presented acutely with a 3-day history of severe migraine unresponsive to oral rizatriptan. Lower cervical paravertebral intramuscular injections resulted in rapid and complete relief of headache and associated symptoms.

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Two subsequent injections performed 2 weeks apart resulted in a marked reduction in the frequency and severity of the headaches, and this improvement was sustained over a period of months.

*Case 2.*—A 36-year-old woman presented with her typical bifrontal and retro-orbital migraine with associated “blurring” of vision, photophobia, phonophobia, nausea, and dizziness. The headache had been present for 2 days and was described as severe. Her baseline headache attack frequency was 1 to 3 episodes per week, and she went to the emergency department for meperidine injections 2 to 3 times per month. Following bilateral lower cervical injections with 1.5 mL of bupivacaine and 0.25 mL of solumedrol acetate 20 mg/mL, the patient experienced complete headache relief within 5 minutes. The nausea, photophobia, blurred vision, and head sensitivity to touch also rapidly resolved. A follow-up series of 3 injections was administered over 6 weeks followed by “booster” bupivacaine injections every 2 months, and these effectively controlled the headaches. Over 2 years of follow-up, she required no emergency department visits.

*Case 3.*—This 20-year-old man presented with an incapacitating migraine that persisted throughout a 3-day weekend. The attack began with his typical visual aura of flashing lights and zigzag lines in the right visual fields. He described associated photophobia, phonophobia, nausea, and vomiting. His examination was notable for left lateral head tenderness to touch and pressure hyperalgesia over the left occiput. Bilateral lower cervical intramuscular injection of 1.5 mL bupivacaine and 0.25 mL of solumedrol acetate 20 mg/mL resulted in an ascending paresthesia into the back of the head followed by headache relief within 1 minute. Photophobia and head allodynia and hyperalgesia also dissipated rapidly. The patient remained headache-free over the next week.

**Tension-type Headache.**—*Case 4.*—A 45-year-old woman with a long history of episodic, typically prolonged, tension-type headaches presented with a headache continuous for 2 weeks. She described the headache as a “tight band” around her head. She denied aura, phonophobia, photophobia, or nausea. Her temples and occiput were tender to palpation. Bilateral lower cervical injection with a solution of 1.5 mL of bupivacaine and 0.25 mL of solumedrol ac-

etate 20 mg/mL resulted in complete resolution of the headache within 5 minutes.

**Chronic Daily Headache.**—*Case 5.*—A 37-year-old woman reported a 20-year history of chronic daily headache unresponsive to a variety of treatments. She described the pain intensity as 8 of 10 on a verbal pain scale. The pain was continuous and most painful in the temples, neck, and posterior head. Injection with 1.5 mL of 0.5% bupivacaine and solumedrol resulted in rapid and complete relief of the headache. When the headache returned several days later, she described it as being of lower intensity than usual. Two weeks later, she reported a 60% improvement in her headache syndrome, with headaches now occurring 3 to 4 days per week. Headache intensity also was reduced. The headaches subsequently resolved altogether following 3 bilateral injections 2 weeks apart, and did not recur over 1 year of follow-up.

**Postherpetic Neuralgia.**—*Case 6.*—A 68-year-old woman presented with chronic postherpetic facial pain involving the distribution of the ophthalmic division of the right trigeminal nerve. The pain had persisted for 1 year despite treatment with intravenous acyclovir, patient-controlled analgesia with intravenous meperidine, carbamazepine, amitriptyline, ibuprofen, and hydrocodone bitartrate. An initial injection with 0.5% bupivacaine and methylprednisolone reduced the pain significantly, and a subsequent series of 3 injections resulted in complete resolution of the facial pain.

**Trigeminal Neuralgia.**—*Case 7.*—A 42-year-old man presented with a 6-year history of left-sided trigeminal neuralgia that was controlled with amitriptyline and gabapentin. After resolution of his symptoms, he stopped all medications for 2 years. Four months before his clinic visit, he experienced recurrent trigeminal neuralgia. Injection of bupivacaine and methylprednisolone resulted in 4 days of complete pain relief. A subsequent series of 3 injections resulted in sustained pain relief, and gabapentin 400 mg three times a day was prescribed. He remained pain-free for the following year.

## COMMENTS

The patients described in this report experienced rapid relief of pain hyperalgesia and allodynia that involved regions innervated by the trigeminovascular

system. A small amount of anesthetic injected into lower cervical paravertebral musculature appears to have had an effect on central headache-generating centers and the trigeminocervical neurons. Both acute and long-standing headaches were rapidly terminated.

Activation of the trigeminovascular system increasingly is considered to be the common final pathway for a spectrum of headache types.<sup>1-4</sup> The role of the trigeminovascular system in the development of migraine has been clearly established, with activation of the trigeminovascular pain structures influencing the trigeminocervical complex of neurons in the caudal brain stem and upper cervical spinal cord.<sup>5-7</sup> That lower cervical injections resulted in rapid relief of head or face pain in our patients supports the hypothesis that trigeminocervical neurons are integral to pain signal transmission from structures above the neck.

Research by Malick and Burstein suggested that migraine involves both peripheral and central sensitization, and that the development of scalp tenderness consequent to acute migraine is mediated mainly through central sensitization.<sup>8</sup> The relief from allodynia and headache experienced by our patients may reflect activation of a central pain suppression mechanism or the blocking of peripheral sensitization with subsequent interruption of central sensitization as hypothesized for botulinum toxin type A.<sup>9</sup>

Other investigators have shown that headaches can be alleviated by spinal injections at higher levels; third occipital nerve blocks, injections at the lateral aspect of the atlanto-axial joints, C2 root ganglion block therapy, and methylprednisolone injection near the greater and lesser occipital nerves are documented to relieve headaches.<sup>10-13</sup> It is possible that the relief of frontal headache associated with upper cervical nerve and occipital nerve blockade is the result of a trigeminal pain relief response similar to that obtained from our bupivacaine blockade of dorsal cervical rami at the seventh cervical vertebra.

Regardless, this small series is not sufficient to establish the procedure involved as a treatment of proven efficacy for acute or chronic head or face pain.

We currently are conducting a blinded controlled study to confirm these very preliminary results.

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