Osteopathic Manipulative Treatment for Facial Numbness and Pain After Whiplash Injury

Josephine Sun Genese, DO, MS

From the Charlotte Hungerford Hospital in Torrington, Connecticut. Dr Genese has a master's degree in medical science.

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Address correspondence to Josephine Sun Genese, DO, MS, 780 Litchfield St, Torrington, CT 06792-6268.

E-mail: josun12345@yahoo.com

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Whiplash injury is often caused by rear-end motor vehicle collisions. Symptoms such as neck pain and stiffness or arm pain or numbness are common with whiplash injury. The author reports a case of right facial numbness and right cheek pain after a whiplash injury. Osteopathic manipulative treatment techniques applied at the level of the cervical spine, suboccipital region, and cranial region alleviated the patient's facial symptoms by treating the right-sided strain of the trigeminal nerve. The strain on the trigeminal nerve likely occurred at the upper cervical spine, at the nerve's cauda, and at the brainstem, the nerve's point of origin. The temporal portion of the cranium played a major role in the strain on the maxillary.

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A whiplash injury refers to the sudden flexion and extension of the neck from a traumatic event and is commonly associated with rear-end and head-on motor vehicle collisions. Whiplash-associated disorder refers to symptoms that develop after whiplash injury such as headache at the base of the skull, neck pain, neck spasm, and stiffness in the neck.[1]

A literature search of "trigeminal nerve dysfunction whiplash" using the US National Library of Medicine's PubMed database generated a handful of closely related articles demonstrating the effects of whiplash-associated disorder on the trigeminal nerve. In a study by Häggman-Henrikson et al,[2] 44 of 50 patients (88%) described frequent jaw or face pain as a consequence of chronic whiplash-associated disorder. A prospective study of 34 patients by Sterner et al[3] reported trigeminal sensory impairment after whiplash trauma and concluded that the impairment was caused by dysfunction of the central nervous system or inhibitory mechanisms; no statistically significant relationship connected whiplash trauma to musculoskeletal symptoms. One study by Knibestöl et al[4] demonstrated trigeminal sensory impairment in 30 patients after soft-tissue injury of the upper spinal cord segments and pontomedullary levels of the brainstem in a quantitative evaluation of cutaneous thresholds for vibration and temperature. Finally, Jacob et al[5] reported cases of rare headache syndromes classified as trigeminal autonomic cephalagias, which were short-lasting, unilateral, neuralgiform headache attacks with conjunctival injection and tearing and paroxysmal orbitofrontal-temporal pains.

In the present report, I describe a case of whiplash injury with an unusual manifestation of right facial numbness and right cheek pain. This case illustrates the benefits of osteopathic manipulative treatment (OMT).

Report of Case

A woman presented to the walk-in clinic with a complaint of right facial numbness and right cheek pain 24 hours after a motor vehicle collision. She was riding in the front passenger seat when the accident occurred. She described her facial pain as a constant ache, rating the level of pain at 4 out of 10. The onset of pain occurred and was noted by the patient shortly after the incident. She had taken no means to relieve that pain and assumed the pain would resolve on its own.

The patient recounted that the car in which she was a passenger was slowing down when it was struck from behind by a car travelling at a high speed. This caused the car she was in to strike the truck in front of her. She was restrained by the seat belt but the air bags did not deploy. She had no recollection of hitting her head but remembered her neck and head taking on a whipping movement. She did not consider her injury serious enough to merit immediate medical attention. The patient presented a day later because of the persistent request of her friend who was driving the car. In addition to the right facial numbness and right cheek pain, she reported clear watery drainage from the right ear, discomfort in the right shoulder and right side of the neck where her seat belt had contact, and vertigo. The patient denied chest pain, shortness of breath, fevers, or chills. She attributed her vertigo, which had been present on and off for years, to chronic seasonal allergies.

Her past medical history was notable for seasonal allergies causing congestion in her right ear and some right cheek swelling; she had been seeing an allergist for both conditions. The patient reported that she had never been in a car accident before the previous day but that she had bone spurs in both shoulders. She attributed the bone spurs to overuse of her shoulders in her occupation as a "cleaning lady."

On examination, the patient appeared slightly obese and in no apparent distress with a blood pressure of 167/78 mm Hg. A motor examination revealed her cranial nerves to be intact. She was receptive to light touch for all cranial nerves except for the trigeminal nerve on the right. Her sinuses were not tender to palpation. Her right tympanic membrane was opacified and appeared mildly injected. Results of her heart and lung examinations were normal. Osteopathic structural examination revealed left greater than right paraspinal muscle spasm from the level of the T10 to L4 vertebrae, a tender point in the left paraspinal muscle at the level of the L3 vertebra, right paraspinal cervical spasm from the level of the C2 to C5 vertebrae, and an extended occipitoatlantal (OA) joint. She demonstrated no point tenderness along the spine and no apparent stiffness.

I began by treating the left thoracolumbar paraspinal spasm with myofascial release and inhibitory pressure technique. As I performed the inhibitory pressure technique, I instructed the patient to breathe deeply as I gently applied pressure to the painful spasm in her lumbar region. I then switched to the counterstrain technique because of her increasing amount of pain. With this technique, I found the most painful point in this area of lumbar spasm: the left side of the L3 vertebra.

After applying OMT to the somatic dysfunction in the thoracic and lumbar regions, I applied myofascial release to the spasm along the cervical spine. As the spasm resolved, I used occipitoatlantal decompression to treat the extended occipitoatlantal joint. I returned to the cervical spine to treat the remaining spasms with myofascial release technique. The patient reported that her numbness had resolved but that her right cheek still hurt. I then checked her cranium for restrictions and noted that the right temporal section was locked in internal rotation. The right temporal portion of the patient's skull was restricted and asymmetric compared with the left, "healthy" side. The left temporal portion of her cranium felt full and rhythmic, whereas the right felt flat and "stuck." As I held both earlobes, I traced the temporal portion of the cranium toward its direction of ease while applying gentle traction on the right ear lobe until both

temporal bones felt symmetrical. I continued to monitor the temporal portion of the cranium via contact with the ear lobes until I sensed symmetrical internal and external rotation of the cranium. The patient stated that the pain in her cheek had resolved.

The patient remained symptom free at 4-month and 6-month follow-up.

Comment

When treating a patient who has experienced an acute traumatic event such as a whiplash injury, techniques that could aggravate existing muscle spasms (eg, high-velocity, low-amplitude) should be avoided. The OMT techniques used for the patient described in the current report were myofascial release, inhibition, counterstrain, and cranial OMT. The inhibition technique in the lumbar region induced too much pain for the patient to tolerate. Any OMT techniques applied to the thoracic spine and suboccipital area should precede treatment of the cervical spine in whiplash injuries.[6(p525)] In a pilot study from Italy,[7] researchers reported that patients with whiplash-associated disorder who were treated with myofascial manipulative therapy showed improved neck flexion compared with patients who were treated with neck exercises and mobilization. Both treatment regimens were 2 weeks long.

After the current patient's thoracolumbar area was treated, decompression of the extended occipitoatlantal region relieved the numbness in the right side of her face but did not mitigate her right cheek pain. The right facial involvement implicates the fifth cranial nerve, or the trigeminal nerve. Pathologic conditions that may affect the trigeminal nerve are neoplasm, vascular compression, malformation or bleeding, multiple sclerosis, osteitis, viral rhomboencephalitis, syringobulbia, abscess, and sinusitis.[8] These possible diagnoses were, however, unlikely on the basis of the patient's medical history and physical examination findings.

I next evaluated the cranium, specifically the temporal portion, because of the patient's long-standing history of allergies affecting her right inner ear and because of the close relationship the trigeminal nerve has with this area.

The trigeminal nerve provides sensation to the face and a large part of the scalp and has 3 divisions: ophthalmic, maxillary, and mandibular. The nuclei reside in ventral pons of the brainstem. A portion of nerve fibers descend from the brainstem and reach the upper cervical portion of the spine, which involves mostly pain and thermal sensation. Sensory axons from the pons travel anteriorly along the petrous ridge of the temporal bone to the trigeminal ganglion, which is found in the trigeminal cave (ie, the Meckel space). This ganglion then sends the 3 branches of the trigeminal nerve through the superior orbital fissure (ophthalmic branch), foramen rotundum (maxillary branch), and foramen ovale (mandibular branch) of the sphenoid bone.

The right cheek numbness that the patient reported likely originated in the maxillary nerve, which is wholly sensory and exits from the foramen rotundum inferolateral to the cavernous sinus. The nerve then enters the pterygopalatine (sphenopalatine) fossa, its main trunk inclining laterally on the posterior surface of the palatine bone at the orbital process and on the upper part of the posterior surface of the maxilla. The maxillary nerve continues through the infraorbital fissure of the maxilla and emerges as the infraorbital nerve, which innervates the middle third of the face and upper teeth.[9]

Restriction or pathologic conditions anywhere along the trigeminal nerve affects facial sensation. Patients with upper cervical disk herniation will sometimes present with trigeminal sensory neuropathy.[10] A small unilateral lesion in the caudal half of the pons or the lateral aspect of the medulla may cause the patient to lose pain and temperature sensations on the ipsilateral side of the face and on the contralateral side in the limbs, trunk, neck, and back of the head.[11]

The resolution of the patient's cheek pain after treatment indicates that the temporal area of the cranium may have contributed to the irritation of the V2 branch of the trigeminal nerve by indirectly affecting the sphenoid and the maxilla where V2 re-emerges. The strain may have occurred in the cranium anywhere along the path of the maxillary nerve.

The patient's symptoms are unique to whiplash-associated disorder. The preexisting pathology, coupled with the patient's allergies, limited the severity of the whiplash injury. The car accident may have been the final factor that caused her unusual presentation.

Conclusion

The occipitoatlantal and cervical areas proved to be the chief factors in the patient's facial numbness. The right temporal bone also played a major role in the patient's facial pain. Knowledge of anatomy, OMT techniques, and osteopathic principles and practice is important in successful management of musculoskeletal injury, especially in novel cases. Osteopathic maniulative treatment offers relief for patients by addressing the cause instead of masking the symptoms, as seen in the present case.

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