

Stinger/Burner Syndrome

Warren Hammer, MS, DC, DABCO

This syndrome is usually due to a stretching of the brachial plexus or nerve roots due to an elongation of the interval between the head and shoulder.¹ This type of injury is most common in tackle football or wrestling, but may occur with any accident that creates this sudden type of stretch between the cervical spine and shoulder. Symptoms include intense burning pain about the shoulder; a burning numbness; radiation into the arm or hand followed by a sense of heaviness or deadness; and dysesthesia and paresthesia throughout the upper extremity.² Many recover within minutes, and most of the time they probably go unreported. It is estimated that 50% of varsity collegiate football players over a 4-year period may experience this problem, while 5% to 10% are more serious, presenting with a neurologic deficit lasting several hours or longer.²

A key factor to consider in such injuries is whether the brachial plexus, the cervical nerve root, or both are involved. Half of the burners or stingers in football at the high-school level involve a brachial plexus stretch injury, while at the college and professional level, the injury usually involves a cervical nerve root "pinch" within the neural foramen.³

In the cervical nerve root "pinch," the symptoms are often sensory in a dermatomal distribution without motor signs, because the dorsal root ganglion within the foramen lies under the subluxating facet. If the shoulder is depressed, with the arm at the side and with extreme contralateral flexion of the neck, most of the stress falls on the upper roots (C5, C6) and upper part of the brachial plexus.

Weinstein⁴ states that a stinger may also occur from a compressive injury as well as a traction injury. He states that based on neuroanatomic features, the peripheral nerves of the cervical spine are actually at greater risk than the brachial plexus for the above injuries. The nerve root/spinal nerve complex is more susceptible to both compressive and tensile load than the brachial plexus because the motor and sensory nerve roots do not have the perineurial tissue around it that the peripheral spinal nerve has. The spinal nerve root exits as a single funiculus of a motor and sensory nerve root, while the nerve trunk has more bundles, allowing more resistance to tensile load. Cervical posterolateral extension narrows the neuroforamen around a nerve lacking epineurial tissue. In this type of traction injury, the anterior nerve root is more vulnerable than the posterior nerve root, which explains why, with residual neurologic deficits after a stinger, motor weakness is more persistent than sensory findings. The anterior nerve root has a thinner dural sheath than the dorsal root and lacks the dampening affect of the dorsal root ganglion. The brachial plexus is therefore more resistant to tensile load because of its plexiform structure, its perineurial tissue, and its increased number of funiculi (versus a single root-nerve bundle).

After an injury to the cervical spine, bilateral cervical radiculopathy, or even while lying on the playing field, you should think of a spinal cord injury. Active cervical range of motion evaluation off the field, or immediately after an injury, should be allowed only to the point of pain, while passive cervical range

of motion should be excluded early on due to the possibility of fracture. Motor evaluation should stress the fifth, sixth and seventh myotomes by testing those muscles, as well as the deltoid; biceps; brachioradialis; triceps, serratus anterior; and wrist flexors and extensors, comparing to the opposite side.⁴ If myotomal weakness lasts over 2 weeks or increases over the first few days, then further testing is necessary. EMG testing is recommended 7 to 10 days after onset of symptoms. Cervical flexion/extension views may show neuroforaminal encroachment due to facet or uncovertebral joint arthropathy, loss of cervical lordosis, and hypermobility.⁴

Treatment involves adjusting of spinal subluxations, normalizing flexibility, and strengthening of weakened muscles. In the paper by Weinstein, a medical doctor, it was interesting to note his emphasis on the treatment of any generalized postural dysfunction.⁴ He stated that the sports practitioner is first told to "correct" the cervical lordosis, but in order to be completely corrected, this finding must take into account overall posture, especially the forward head posture. This includes an increased thoracic kyphosis; excessive scapulae protraction; glenohumeral internal rotation; hyperflexion and hypomobility of the lower cervical and upper thoracic segments; hypomobility and hyperextension of the upper cervical segments; and relative segmental hypermobility of the midcervical segments due to unloading of the zygapophyseal joints.

Hypermobility of the midcervical segments may create early degenerative disc changes and uncovertebral joint arthropathy, narrowing the foramina and predisposing the athlete to compressive and tensile overloading. Muscle shortening and lengthening must also be considered in the forward head posture. Shortened muscles include the capital and cervical extensors; sternocleidomastoid; upper trapezius; levator scapula; pectoralis minor and major; anterior deltoid; subscapularis; serratus anterior; and anterior scalene. The lengthened muscles include the capital and cervical flexors; middle and lower trapezius; rhomboids; thoracic extensors; and latissimus dorsi.

Weinstein recommends manual therapy, including manipulation of "hypomobile segments" only, and myofascial stretching techniques such as "myofascial release." He notes that release of the tight paraspinal musculature may uncover splinted or protected hypermobilities in the midcervical spine. He states that, in order to prevent the rounding of the shoulders, balanced strengthening of the anterior and posterior shoulder girdle musculature is critical.

References

1. Barnes R. Traction injuries of the brachial plexus in adults. *J Bone & Jt Surg* 1949;31B:10-16.
2. Speer KP, Bassett FH. The prolonged burner syndrome. *Amer J Sports Med* 1990;18(6):591-594.
3. Cantu RC, Bailes JE, Wilberger JE. Guidelines for return to contact or collision sport after a cervical spine injury. *Clin Sports Med* 1998;17(1):137-146.
4. Weinstein SM. Assessment and rehabilitation of the athlete with a "stinger": a model for the management of noncatastrophic athletic cervical spine injury. *Clin Sports Med* 1998;17(1):127-135.

*Warren I. Hammer, MS, DC, DABCO
Norwalk, Connecticut*

MARCH 1998

