RESEARCH UPDATE: STINGERS IN THE ATHLETE

Dan Lorenz, PT, DPT, ATC/L, CSCS

Note: The following summary was written due to a request from a SIG colleague on the latest research on stingers and manual therapy treatments for them.

• Incidence in college football is 50-65% throughout a 4 year career.[7] There is a paucity of data on prevention and treatment for burners/stingers, but there is some data on cervical neurapraxia in athletes that involve stenosis, either centrally or laterally that resulted in varying symptoms.[1,4]

• Stingers are most common at the C5-6 level.[5,6,9,10] Erb's point is often insulted by direct trauma. Weakness in shoulder abduction, external rotation, and arm flexion are reliable indicators. Radiating pain resolves usually within minutes, but motor function may take up to 48 hours. Muscle weakness has been reported however up to 6 weeks after injury.

• Three main mechanisms are described that may result in a stinger:[6] compression and extension (85% of cases), distraction of the shoulder from the head and neck, and a direct blow to Erb's point where the plexus is most superficial. Erb's point is located superior and deep to the medial clavicle, just lateral to the SCM muscle. Tinel's sign may be elicited here, but sensitivity and specificity of this have not been reported.

• The Pavlov ratio or ratio method has been found to be more sensitive than the Torg ratio for determining stenosis, which may put athletes at risk for stingers.[7] A ratio of 0.80 or less has been found to be sensitive for transient neurapraxia (93%). A detailed explanation of these ratios is found in both Castro and Weinberg et al.[3,9]

• Diagnostic tests including a complete cervical spine series, MRI to determine soft tissue injuries, and electrodiagnostics to localize the site of injury and degree of neurologic damage are advocated. Not every athlete needs imaging, but it should be considered in athletes with persistent symptoms, neurologic deficits, or recurrent events (2 or more stingers).[8]

• It has been suggested that three or more significant stingers in a season prompts consideration for removal from play for the remainder of that season.[8] There is no agreed upon limit as to how many stingers a given athlete can sustain within a season or career, nor of the precise clinical or diagnostic criteria necessary for decisions about continued sports participation.

- RTP criteria per Standaert et al:[8] adequate time to heal from primary injury, absence of underlying conditions that pose undue risk of further injury, resolution of all symptoms, full pain-free ROM, appropriate cardiovascular fitness, normal strength, and ability to perform sport specific skills without symptoms.

• Vaccaro et al[10] – **Contraindications to return to play**:

No contraindications – fewer than three episodes of a prior stinger lasting <24 hours with full ROM without neuro deficit or one episode of transient quadriparesis/quadriplegia with full cervical ROM, no neuro deficit, and no evidence of a herniated disc or instability.

Relative contraindications – prolonged stinger or transient quadriparesis lasting >24 hours or three or more previous stingers or two episodes of transient quadriparesis/quadriplegia.

Absolute contraindications – more than two previous episodes of transient quadriparesis/quadriplegia, clinical history, examination, or imaging confirming cervical myelopathy, or continued cervical neck discomfort, decreased ROM, or evidence of neurologic deficit from baseline after any cervical injury.

• Little data supports cervical collars in the prevention of stingers. Shannon and Klimkiewicz[7] have advocated using "chest out posturing" and "thoracic outlet obstruction exercises". Neck isometrics have also been advocated. There is general agreement that a host of modalities can be used, and strengthening of the neck, shoulder, and scapular muscles is needed to treat these injuries.

• I am not aware of any manual techniques used specifically for stingers, nor could I find any mention of them in the literature. I would argue that relief from traction should take place should take place first. Paris has previously suggested placing a subject in sitting with the arms resting on a treatment table on pillows at approximately 80-90° abduction. In this position, soft tissue massage to the upper traps, deltoid, and upper arm can take place, or other modalities like ice massage or ultrasound could be used. Intuitively, it would be contraindicated to stretch the scalenes, upper traps, or SCM in the initial stages. Because of the traction injury and the potential fascial insult, many non-specific myofascial techniques could be used. Cantu and Grodin[2] have proposed many techniques for the upper quarter that include cervical and thoracic laminar release, transverse fascial stretch of the biceps, muscle splay of the forearm, and transverse muscle bending of the forearm. The premise behind using these techniques is to separate the fascial planes, promote fluid movement, and decrease underlying tone. I also suggest reading Myers' *Anatomy Trains* for a more in depth analysis of myofascial treatment. Once the neuromuscular system has recovered, a progressive strengthening program is advocated for the scapular stabilizers, upper trapezii, and cervical musculature. Anecdotally, I propose that strengthening should be done first with shorter lever arms to minimize traction to the plexus. I have had success with this concept previously. For example, lateral and scaption raises are commonly used to strengthen the rotator cuff, and prone horizontal abduction for the interscapulars. I suggest starting with a weight at mid-shaft of the humerus, progressing to the elbow and eventually a dumbbell in the hand. While it may be conservative, it ensures that principles of progressive overload are adhered to and limits any pain or irritation from resistance exercise if the athlete is too acute to tolerate distal resistance. Furthermore, it may allow an athlete to tolerate resistance training earlier in the rehab progression.

Does anyone have any techniques that they would like to share with members?

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