

Sports Medicine Monthly

Editor: Darren H. Lunow, M.Ed, ATC, LAT • Certified Athletic Trainer

Volume 2, Issue 4, November 2010

FOCUS ISSUE:

NECK INJURIES IN FOOTBALL

Cervical Spine Integrity and the Importance of Proper Tackling Technique



Over the course of any given weekend in the fall, anyone who watches high school, college, or professional football will usually see at least one on-the-field

cervical spine evaluation being performed. The game stops, the replays begin, and the Certified Athletic Trainers and Orthopedic Physicians are seen stabilizing an athlete's neck while completing an evaluation of the athlete's cervical spine. Fortunately, most of these athletes usually walk off the field. Rarely though, a few do not. In looking to mitigate these few, and hopefully reduce the frequency of all cervical spine injuries, great amounts of research and study have been performed to determine the optimal cervical spine position during contact and the optimal point with which to initiate contact when tackling.

The cervical spine is a collective term that describes the structural (i.e. bones, ligaments, etc...) aspects of the most superior 7 vertebrae in the spine. The c-spine, as it is often called, has a natural forward curvature, and this curvature allows the various muscles about the c-spine to provide tremendous stability to the intervertebral joints. This is where proper tackling comes in. When the head is up, and contact is initiated with the shoulder or chest, the neck musculature is very capable of maintaining cervical spine stability and curvature. However, when the head is lowered, the cervical spine straightens and the vertebrae align in a column-like formation.

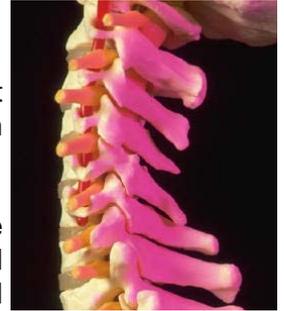


continued on page 2

Brachial Plexus Neuropathy: Anatomy of the "Stinger"

Anatomy:

The brachial plexus refers to a collection of six nerves which exit the spinal cord sequentially from the levels of the fifth cervical vertebrae (C5) through the first thoracic vertebrae (T1). These nerves provide for the motor and sensation functions of the lateral shoulder and the upper extremity.



They each exit from a small foramen (i.e. hole) that is created by the vertebrae above and the vertebrae below, merge and weave together, and proceed downward between the clavicle and the first rib towards the armpit.

Injury:

Injury to the brachial plexus occurs when the nerves themselves are actually bruised; either by a forceful stretch or by a forceful compression. Overall, this usually occurs in in one of three manners:

- 1) When the head is forcefully compressed inferiorly the space between the vertebra is decreased, and the nerves of the brachial plexus can be pinched as each foramen diameter is decreased.
- 2) When the head is laterally flexed away from a shoulder that is simultaneously being depressed, the brachial plexus can be overstretched.
- 3) When the head is laterally flexed towards a shoulder that is simultaneously being elevated, the brachial plexus can be compressed between the collar bone and the first rib.



Tulsa: 918.481.CSOS (2767) • Statewide: 888.269.CSOS (2767) • www.csosortho.com

Tulsa • Owasso • Vinita • Grove • Bixby • Jenks

R. Clio Robertson, MD
Don L. Hawkins, MD
David R. Hicks, MD
Michael W. Tanner, MD
Brian C. Howard, MD
James D. Cash, MD

David E. Nonweiler, MD
Randall L. Hendricks, MD
David K. Wong, MD
Bryan J. Hawkins, MD
Perry D. Inhofe, MD
Thomas G. Craven, MD

Jeffrey R. Morris, DO
Ronald S. LaButti, DO
Jeff A. Fox, MD
Kathleen M. Sisler, MD
Troy A. Glaser, DO

**Brachial Plexus Neuropathy:
Treatment and Management of
the “Stinger”**

Presentation:

Athletes who have sustained injury to the brachial plexus usually present with the following temporary signs and symptoms:



- *A ‘burning’ or ‘stinging’ sensation in the neck and shoulder.
- *Numbness in the shoulder and in the arm
- *Weakness in the deltoid, bicep, and rotator cuff musculature which causes an inability to raise the arm, flex the elbow, or rotate the shoulder

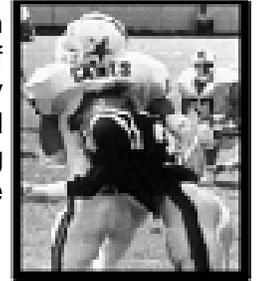
Treatment:

As the ‘burning’ or ‘stinging’ sensation causes the athlete the most discomfort, arm rest along with the application of an ice bag to the neck and shoulder region will decrease the athlete’s overall discomfort. Likewise, most conditions will note immediate improvement with rapid reduction in pain and the return of full strength within 5-10 minutes. Return to competition is therefore a function of such. Athletes who have no neurological symptoms (i.e. numbness, burning, altered sensation, etc...), full muscular strength, and full, pain free neck, shoulder, and arm range of motion within this 5-10 minute window are permitted to return to competition pending additional symptom monitoring and follow-up evaluations. Any athlete who does not have a complete resolve of all symptoms within 5-10 minutes should undergo further evaluation by a Certified Athletic Trainer or an Orthopedic Physician. Likewise, athletes who have a history of multiple brachial plexus injuries should also undergo further cervical spine and brachial plexus evaluation.



Cervical Spine Integrity continued:

When contact is then initiated with the top of the head, the majority of the contact force is subsequently transmitted through the vertebra and the discs rather than the surrounding musculature. This can result in the vertebrae and the discs being compressed, crushed, and even displaced. Thereby resulting in severe structural and neurological complications for the athlete. This is the very reason why the ‘spearing’ tackling technique was removed from high school, college, and professional football, and why any contact initiated with the head and likewise with the head down, is greatly discouraged in contact sports. Any time contact is initiated with the head, the athlete is at risk of sustaining a concussion. Anytime contact is initiated with the top of the head, the athlete is at risk of sustaining a cervical spine injury.



For those associated with football, and especially for those who are coaches and teachers of the game, it is imperative for all of us to continually stress the importance of proper tackling techniques to our athletes. The head should be up, the shoulder should be down, and contact should be initiated with the shoulder or the chest. In short, teach your athletes to “look at what they hit.”

Picture Obtained from The *National Athletic Trainers’ Association*:
Position Statement: Head-Down Contact and Spearing in Tackle Football, 2004

A Note to the Reader.....

Central States Orthopedic Specialists does not endorse any of the organizations or research groups whose information has been published herein. Furthermore, information in this publication is provided for informational purposes only and not as medical advice, or as a substitute for the advice provided by your physician or other healthcare professional, or for diagnosing or treating a health problem or disease. This publication is designed to provide you, the reader with information only. It is your choice in how you apply the information given herein, and not a directive from Central States Orthopedic Specialist. It is simply an informative resource for you, the reader. As always, if you have specific questions regarding specific injuries, illnesses, policies, procedures, etc... speak with your Certified Athletic Trainer, or contact your physician.



- | | | |
|-----------------------|--------------------------|------------------------|
| R. Clio Robertson, MD | David E. Nonweiler, MD | Jeffrey R. Morris, DO |
| Don L. Hawkins, MD | Randall L. Hendricks, MD | Ronald S. LaButti, DO |
| David R. Hicks, MD | David K. Wong, MD | Jeff A. Fox, MD |
| Michael W. Tanner, MD | Bryan J. Hawkins, MD | Kathleen M. Sisler, MD |
| Brian C. Howard, MD | Perry D. Inhofe, MD | Troy A. Glaser, DO |
| James D. Cash, MD | Thomas G. Craven, MD | |

Tulsa: 918.481.CSOS (2767) • Statewide: 888.269.CSOS (2767) • www.csosortho.com

Tulsa • Owasso • Vinita • Grove • Bixby • Jenks