

“Burners” (Brachial Plexus Injuries)

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“Burners” or “stingers” are so named because the injuries can cause a sudden pain and numbness along the forearm and hand. The more formal medical terminology is transient brachial plexopathy or an injury to the brachial plexus. A brachial plexus injury may also involve injury to a cervical root. An injury to the spinal cord itself is more serious and frequently does not fall under this category of injury, although it shares certain symptoms; therefore, spinal cord injuries should be ruled out when diagnosing stingers.

The majority of stingers occur in football. Such injuries have been reported in 52 percent of college football players during a single season. As many as 70 percent of college football players have experienced stingers. Stingers also can occur in a variety of other sports, including basketball, ice hockey, wrestling and some field events in track.

Mechanism

The most common mechanism for stingers is head movement in an opposite direction from the shoulder either from a hit to the head or downward traction of the shoulder. This can stretch the nerve roots on the side receiving the blow (traction), or compress or pinch those

on the opposite side. Contact to the side of the neck may cause a direct contusion to the brachial plexus. In football, improper blocking and tackling techniques may result in a brachial plexus injury. Coaches, parents and student-athletes should be cautioned regarding the consequences of improper techniques, which may result in cervical spine injuries or trauma to the brachial plexus.

Symptoms and Severity

Student-athletes who suffer burners may be unable to move the affected arm from their side and will complain of burning pain, and potentially, numbness traveling from the injured side of the neck through the shoulder down the arm and forearm, and sometimes into the hand. Weakness may be present in the muscles of the shoulder, elbow and hand.

Brachial plexus injuries can be classified into three categories. The mildest form (Grade 1) neuropraxia injuries that involve demyelination of the axon sheath without intrinsic axonal disruption. Complete recovery typically occurs in a few seconds to days. Grade 1 injuries are the most common in athletics. Grade 2 injuries involve axonotmesis or disruption of the axon and myelin sheath with pres-

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All athletes sustaining burners or stingers should undergo a physical rehabilitation program that includes neck and trunk strengthening exercises. The fit of shoulder pads should be re-checked and consideration of other athletic protective equipment, such as neck rolls and/or collars, should be given. The athlete’s tackling techniques should be reviewed.

ervation of the epineurium, perineurium, and endoneurium, which can serve as the conduit for the regenerating axon as it re-grows at 1 to 7 millimeters per day. Weakness can last for weeks but full recovery typically occurs.

Grade 3 injuries, neurotmesis or complete nerve transections are rare in athletes. Surgical repair of the nerve is required in these cases and complete recovery may not occur.

These classifications have more meaning with regard to anticipated recovery of function than a grading on the severity of symptoms at the time of initial injury.

Treatment and Return to Play

Burners and stingers typically result in symptoms that are sensory in nature, frequently involving the C5 and C6 dermatomes. All athletes sustaining burners should be removed from competition and examined thoroughly for injury to the cervical spine and shoulder. All cervical roots should be assessed for motor and sensory function. If symptoms clear within seconds to several minutes and are not associated with any neck pain, limitation of neck movement or signs of shoulder subluxation or dislocation, the athlete can safely return to competition. It is important to re-examine the athlete after the game and for a few successive days to detect any reoccurrence of weakness or alteration in sensory exam.

If sensory complaints or weakness persists for more than a few minutes, a full medical evaluation with radiographs and consideration for a MRI should be done to rule out cervical disk or other compressive pathology. If symptoms persist for more than 2 to 3 weeks, an EMG may be helpful in assessing the

extent of injury. However, an EMG should not be used for return-to-play criteria, as EMG changes may persist for several years after the symptoms have resolved. Shoulder injuries (acromioclavicular separation, shoulder subluxation or dislocation, and clavicular fractures) should be considered in the differential diagnosis of the athlete with transient or prolonged neurologic symptoms of the upper extremity. Any injured athlete who presents with specific cervical-point tenderness, neck stiffness, bony deformity, fear of moving his/her head and/ or complains of a heavy head should be immobilized on a spine board (as one would for a cervical spine fracture) and transported to a medical facility for a more thorough evaluation.

Bilateral symptoms indicate that



the cord itself has been traumatized and may suggest transient quadriplegia. These athletes should also be immobilized and transported to a medical facility for a more thorough evaluation.

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Stinger assessment should be part of the student-athletes’ preseason physical and mental history (see **book** Guideline No. 1b). “at-risk” athletes that be instructed in a prevention preventative exercise program and be provided with proper protective equipment.

Recurrent Burners

Recurrent burners may be common; 87 percent of athletes in had experienced more than one. Medical personnel should pay special attention to this condition.

Although rare, risk of permanent nerve injury exists for those with recurrent burners. Therefore, participants should report every occurrence to their certified athletic trainers or team physician. Any player with persistent pain, burning, numbness and/or weakness (lasting longer than two minutes) should be held out of competition and referred to a physician for further evaluation.

A Word of Caution

Management of the student-athlete with recurrent burners can be difficult. There are no clear guidelines concerning return to play. Although some risk of permanent nerve injury exists, a review of the literature shows this risk to be small for those with recurrent episodes. The most important concern for student-athletes with recurrent burners is to stress the importance of reporting all symptoms to the attending medical personnel so that a thorough physical examination, with particular attention to strength and sensory changes, can be obtained. Any worsening of symptoms should provoke a more thorough evaluation.

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