

# Return to Play for Athletes

Brett D. Rosenthal, MD\*, Barrett S. Boody, MD, Wellington K. Hsu, MD

## KEYWORDS

• Return to play • Athlete • Stinger • Sports-related trauma • Cervical cord neurapraxia

## KEY POINTS

- Sports-related trauma can cause a variety of spinal injuries.
- Each type of sports-related spine injury has unique clinical characteristics that should be considered before allowing an athlete to return to play.
- In general, athletes should be neurologically intact, pain free, at full strength, and have full range of motion before returning to full, unrestricted athletic activity.

## INTRODUCTION

Spinal cord injuries have an estimated annual incidence of 40 cases per 1 million Americans, with the fourth most common cause of spinal cord injury being sports-related trauma (8.2%).<sup>1</sup> The incidence of sports-related spinal cord injury has decreased since the 1970s (about 14%),<sup>2</sup> which many attribute to injury prevention initiatives and advancements in personal protective equipment.<sup>3</sup> Although spinal cord injury is the most severe form of spine trauma sustained during athletics, lower impact traumas that may result in strains, stingers, disc herniations, or other forms of neural compression are far more common. The spine surgeon is often under substantial extrinsic pressures to determine an athlete's readiness to return to play, so it is critical to base this decision on reproducible metrics.

Most experts agree that, at the very least, an athlete should be neurologically intact, be pain free, be at full strength, and have full range of motion before returning to competitive athletic activities after a sports-related spine injury.<sup>4</sup> However, because of the variety of spine conditions associated with athletes, a single algorithm for determining an athlete's readiness for sport will likely

never exist. As of yet, no major sporting organization has adopted a singular return-to-play guideline or algorithm, which reflects the complexity of the treatment of these patients. Guidelines to determine an athlete's ability to return to play are likely better described based on patient-specific factors. The most common spine conditions sustained during sport activity are described in greater detail in the sections that follow.

## CERVICAL TRAUMA

Cervical spine sport injuries range from minor and transient muscle strains to catastrophic spinal cord injury. During contact sports, the most frequent mechanism responsible for catastrophic spinal cord injury involves an axial load applied to the cervical spine.<sup>5</sup> After spear tackling (head-first tackling) was banned from high school football in the late 1970s, the rate of cervical injuries and traumatic quadriplegia decreased by more than 70% within the first 12 years.<sup>5</sup> Nonetheless, cervical spine injuries accounted for 44.7% of all spinal injuries sustained by National Football League (NFL) athletes during the 2000 to 2010 seasons.<sup>6</sup> These conditions result in a career mean of 23.4 practices and 4.1 games missed among NFL

Disclosure: See last page of article.

Department of Orthopaedic Surgery, Northwestern University, 676 North Saint Clair Street, Suite 1350, Chicago, IL 60611, USA

\* Corresponding author. Department of Orthopaedic Surgery, Northwestern University, 676 North Saint Clair Street, Suite 1350, Chicago, IL 60611.

E-mail address: [brett.david.rosenthal@gmail.com](mailto:brett.david.rosenthal@gmail.com)

Neurosurg Clin N Am ■ (2016) ■-■

<http://dx.doi.org/10.1016/j.nec.2016.08.003>

1042-3680/16/© 2016 Elsevier Inc. All rights reserved.

athletes per injury,<sup>6</sup> and the presence of a cervical spine diagnosis reduces an athlete's likelihood to be drafted despite the absence of differences in career performance.<sup>7</sup>

### ***Cervical Strain/Sprains***

Cervical spine injuries that are predominantly muscular or ligamentous are considered cervical strains or sprains, respectively. Cervical strains and sprains accounted for 21.7% and 15.5% of cervical spine injuries in NFL athletes and were responsible for a career mean of 6.0 and 9.6 days of activity lost per injury, respectively, from 2000 to 2010.<sup>6</sup> Most of these injuries are self-limited, however, despite the lack of direct neurologic insult, spinal instability should still be ruled out to avoid delayed injury. In addition to a detailed history and physical examination, dynamic radiographs are critical to the diagnosis of cervical spine instability. Cantu and colleagues<sup>8</sup> recommended that any subluxation noted after a sport-related injury necessitates a hard cervical collar to be worn at all times with follow-up imaging taken at 2 and 4 weeks after injury. Based on cadaveric studies, the definition of a subluxation is reported at greater than 3.5 mm of horizontal displacement of 1 vertebral body relative to the next or angular displacement of greater than 11° between adjacent vertebrae.<sup>9</sup> These investigators also cautioned that adolescent athletes have increased ligamentous laxity of unclear significance, which may account for measurements outside this norm.<sup>8</sup> If repeat imaging shows stability and pain and range of motion have resolved, most experts agree that return to play for these athletes is safe.

### ***Stingers/Burners***

A stinger or burner is a temporary episode of unilateral upper extremity dysesthesia, which is estimated to occur at least once during the career of more than 50% of athletes participating in contact/collision sports.<sup>10</sup> Although improvements in shoulder pads have reduced the frequency of stinger injuries,<sup>11,12</sup> nerve injuries without evidence of causal anatomic conditions were still the most common cause of cervical spine injury among NFL athletes between 2000 and 2010.<sup>6</sup> Cervical nerve injuries comprised 45.9% of all cervical spine injuries and resulted in a career mean of 15.3 days of activity lost per injury.<sup>6</sup> Motor weakness may not occur during a stinger but, if present, is most common in the C5 and C6 myotomes. Proposed mechanisms of injury include traction injury to the brachial plexus, nerve root compression at the neural foramina, and direct trauma to the

brachial plexus, most often at Erb's point (where the upper trunk can be compressed against a transverse process).<sup>13</sup>

Typically, symptoms resolve within a few minutes. If symptoms have resolved and it is the athlete's first episode of having a stinger, he or she can return to the sporting event as long as cervical range of motion is maintained and no neurologic deficits are present. After the resolution of an athlete's second episode of stinger, Cantu<sup>10</sup> recommends considering use of high shoulder pads, a soft cervical roll to limit neck flexion and extension, and review of the athlete's blocking and tackling techniques to identify if modifications may decrease the likelihood of recurrent injury. Some experts suggest that the occurrence of 3 or more stingers, especially if in rapid succession, is a relative contraindication to continued sport participation.<sup>10,14</sup> Certain athletes, those with foraminal stenosis, are predisposed to recurrent and chronic stinger injuries.<sup>15</sup> Because the dorsal root ganglion occupies the largest proportion of space within the neural foramen, it often takes the brunt of the injury, which is why purely sensory findings may be the result of a stinger.<sup>8</sup> Although the long-term natural history of athletes who have recurrent stingers is not well described in the scientific literature, some believe that recurrent episodes may lead to long-term proximal arm weakness and persistent pain.<sup>10</sup>

If symptoms persist after a stinger injury, alternative etiologies for the athlete's symptoms should be explored. In that situation, radiographs to rule out fractures or instability and an MRI to rule out disc herniation or other structural abnormalities should be performed. Cantu<sup>10</sup> recommends that electromyography be performed if symptoms persist greater than 2 weeks to accurately assess the extent of injury.<sup>10</sup> Weinstein<sup>16</sup> recommends continued cessation from sport if the athlete has clinical weakness and moderate fibrillation potentials 2 weeks postinjury.<sup>16</sup>

### ***Cervical Stenosis, Cervical Cord Neurapraxia, and Transient Quadriplegia***

Cervical stenosis may be present congenitally or caused by degenerative spondylotic changes. One phenomenon, initially described by Torg and colleagues,<sup>17</sup> is that of cervical cord neurapraxia (CCN), wherein an athlete sustains transient bilateral motor or sensory neurologic symptoms that begin after a blow to the head or a whiplash neck injury. One manifestation of this condition is referred to as *transient quadriplegia*. These clinical entities seem to most often occur in athletes who have cervical stenosis.<sup>17-20</sup> Narrowing of the cervical spinal

Download English Version:

<https://daneshyari.com/en/article/5632741>

Download Persian Version:

<https://daneshyari.com/article/5632741>

[Daneshyari.com](https://daneshyari.com)