THE STATE OF SPEARING IN FOOTBALL

Incidence of Cervical Spine Injuries Doesn’t Indicate the Risks

Spearing is most dangerous to the player who spears.
• Keeping the head up at contact protects the neck (Figure 2).
• Initiating contact with the shoulder while keeping the neck in extension virtually eliminates the risk of paralysis.

There are several factors that have impeded the communication of these concepts to the football community.

Spearing Defined
There are many entrenched misconceptions in football regarding the term spearing. One is that the hit must be intentional to be a spear. Another is only tacklers can spear. A third is spearing only occurs if the hit is late. Spearing is best defined as head-down contact, plain and simple. Whether the hit is intentional or unintentional, it’s a spear. If the player is a ball carrier, blocker or tackler, it’s a spear. Head-down contact and spearing are one and the same.

In football circles, though, spearing and head-down contact are often referred to as two different entities. These differing opinions about spearing have hindered its elimination from football. When sports medicine professionals talk about decreasing the incidence of spearing, the football community thinks they are referring to late hits by tacklers. This is a difficult mindset to alter, and the misconception of a spear is the crux of the problem. Perhaps sports medicine professionals should do away with the war on spearing and focus instead on eliminating head-down contact.

Every few years the problem of spearing in football is rediscovered in the media by a cervical spine injury in the NFL. Last season the victim was Detroit Lions linebacker Reggie Brown. Television networks show similar injury-inducing hits numerous times and stories appear in newspapers and magazines. But cervical spine injuries are always portrayed as unfortunate accidents. They are not used to educate the football community that an identified cause exists for these injuries.

No one says, “Reggie Brown made the mistake of lowering his head at contact.” No one says, “These injuries can be prevented by keeping the head up at contact.” Two tragedies surround cervical spine injuries: the tragedy of the injury itself and the tragedy of another missed opportunity for the sports medicine community to educate the masses.

Sports medicine professionals and the media still have not communicated the correct message to football practitioners — coaches, players, officials and administrators. The media is included because of its great influence on practitioners’ opinions. It’s been more than 20 years since Torg et al. established the relationship between cervical spine (Figure 1) injuries, axial loading and head-down contact. And yet the technique remains a common practice in football at every level. Some facts about cervical spine injuries include:

- Each time a player makes contact with his head down, he risks fracturing his cervical spine and being paralyzed.
- The axial loading mechanism of injury does not discriminate by intent; an unintentional spear can result in paralysis (e.g., Reggie Brown).
- A player can spear a member of his own team (e.g., Dennis Byrd).
- Spearing risks pertain to tacklers, ball carriers and blockers.
Reggie Brown’s recovery from a career-ending cervical spine injury has been described as amazing, glorious and stunning. To many in the sports medicine community, it has been nothing short of a miracle.

A rising second-year linebacker with Detroit, Brown was injured Dec. 21, 1997, in the Lions’ 13-10 victory over the New York Jets when he collided with another player while attempting to make a tackle. The hit dislocated Brown’s C1 and C2 vertebrae, bruising his spinal cord and leaving him unable to breathe or move his arms and legs.

Brown, 23, regained consciousness in a hospital near the Silverdome in Pontiac, MI. After several tests he was transferred to Henry Ford Hospital in Detroit. Methylprednisolone, a powerful steroid related to cortisone, was given to Brown early and in massive doses — a key to jump-starting his recovery.

“One of the biggest factors why he’s doing so well now is related to the outstanding care that he had in the first hour of the injury,” Christopher Shaffrey, MD, one of Brown’s surgeons, said. “Very few people at the exact moment of injury are tended to by a group of physicians who do all the right things right off the bat and have all treatments initiated within several minutes after that degree of an injury.”

Research indicates that improper treatment within the first few minutes of an injury often ends in tragedy for the more than 15,000 people annually in North America who incur spinal injuries. The day after Brown’s injury, surgery was performed to fuse his two vertebrae. Two-inch titanium screws were used to realign the vertebrae and bone grafts were added to stabilize the fusion. Only two days postsurgery, Brown walked 20 yards when doctors asked him to stand — an accomplishment that was six months, maybe even a year, ahead of schedule.

Brown’s recovery will likely take a year. The range of motion in his neck will be permanently impaired, and he may not regain complete strength in his hands. A halo kept Brown’s neck immobile for several months, and he’s continuing therapy on an outpatient basis in Austin, TX. His recovery puts him in the top 2 percent of patients who sustain such injuries, according to Russ Nockels, MD, who performed the vertebrae fusion.

Nockels said Brown registered zero on a motor function index immediately after the injury. He was at 49 in the hospital and has now reached 89 (100 is a healthy, mobile person). “Reggie has been making the kind of progress that we all dream about patients making. For every one Reggie, there are 99 who don’t do so well.”

The surgeon credited Lions head athletic trainer Kent Falb and team physicians David Collon, Keith Burch and Terry Lock, “who all did absolutely exquisitely the appropriate things and represent an elite team in terms of how they provided care for Reggie.”

Spearing Rules

The spearing penalty is unique in football. Most penalties protect one player from the actions of another. Spearing, when properly enforced, is the only action penalty that penalizes a player for his own protection. The primary intent of the penalty is to protect the spearing player from paralysis. This puts the coach in a difficult position, which actually is a paradox. Protecting his players means penalizing his own team. This paradox has, in turn, led to another misconception about spearing.

It is commonly thought the spearing penalty is designed to protect the player who is speared. In a survey of New Jersey high school officials, more than one-third responded this was the primary purpose of the penalty. The NFL reinforces this message weekly when it fines players for spearing only if they endanger an opponent. This ties back into the misunderstanding of what constitutes a spear. Although the rule should protect both players, the player who risks permanent paralysis is the one who spears.

There is much work that can be done with football officials. The New Jersey survey revealed that 87 percent of the officials called three spearing penalties or less in an entire season (an average of 27 games). In other words, an official called only one spearing penalty for every 20 games worked. This fact will do little to decrease the incidence of spearing.

The survey also revealed several contradictions. One-half of the officials believed a spear had to be intentional for a penalty to be called, while the other half indicated intent was not a factor. More than 40 percent of the officials said deciding intent made the rule difficult to enforce; therefore, the intent of the spear appeared to be a major stumbling block. Only half of the officials indicated they were likely
to call a spearing penalty on an athlete who accidentally speared. Ironically, 97 percent of the officials believed a head or neck injury could occur regardless of an athlete’s intent to spear.

A Louisiana survey found that nearly one-third of high school players did not know it was illegal to tackle with the top of the helmet or run over an opponent head-first. This number probably would be lower if the athletes were asked about holding, clipping or face mask penalties. Why is this? It may be because these penalties are enforced regularly during games, while the spearing penalty is not enforced. An enforcement level of three to four spearing calls per game would influence coaches to spend more time educating and practicing correct technique with their players.

The Incidence of Spearing

There is a general lack of urgency regarding spearing in the football community. The apathy toward head-down contact directly relates to the infrequency in which it results in catastrophic injuries. In 1996 there were 1.8 million football players and nine cervical spine injuries that resulted in paralysis. This translates to 0.50 injuries for every 100,000 participants. These are low numbers. Combined with the fabulous reduction in catastrophic neck injuries since the rule change in 1976, the issue of cervical spine injuries looks even rosier. To the casual observer, the numbers indeed may indicate there is not much of a spearing problem.

This is a myth, however. The reality is that the correlation between spearing incidents and incidence of paralysis is very low. Hodgson and Thomas stated, “The number of paralyzed players evidently does not come close to identifying the extent of the risk of hitting with the head down.” Not every head-down contact results in axial loading to the cervical spine but just about every cervical spine fracture has resulted from head-down contact and axial loading.

Estimates indicate that 200 spears occurred during one team’s season (nine games) and 2.8 million head-down contacts occurred nationally between tacklers and ball carriers in one year. This translates to one case of quadriplegia for every 251,000 spears. Based on these numbers, a high school should have one case of quadriplegia for every 11,000 games. These are rough estimates at best, but they do demonstrate that the injuries are few and the exposures to injury are many.

Additional research indicates that head-down contact occurs on 41 percent of the plays during a high school game, or once in every 2.4 plays. Spearing occurred on 38 percent of running plays and 37 percent of kick returns. Tacklers speared on 26 percent of the plays. Similarly, Drake found tacklers speared at a 21 percent rate. Defensive backs and linebackers accounted for 72 percent of defensive spears, while ball carriers speared on 16 to 20 percent of plays. Running backs accounted for 85 percent of spears by ball carriers.

Spear by ball carriers is interesting in that defensive players were four times more likely to spear when tackling a spearing ball carrier. A spearing ball carrier influences tacklers to “get lower” than the ball carrier or take him on in similar fashion. Both scenarios usually result in the tackler dropping his head at contact. This coincides with Drake’s finding that tacklers were more likely to spear when tackling below the waist.

Spear also has evolved since the 1976 rule change. The rule was geared toward intentional spearing by tacklers. Today ball carriers and tacklers are approaching contact with their head up and dropping it at the last moment. Referred to as unintentional spearing, this remains an acceptable part of football. However, unintentional spearing still exposes the athlete to the risk of paralysis.

Making the Game Safer

Catastrophic injuries are not necessarily inherent to football. Sports medicine professionals traditionally have focused solely on the number of times a spear results in catastrophic injury. The time has come to focus on the frequency of head-down contact, and 2.8 million spears indicates plenty of room for improvement.

A reasonable assumption is that a reduction in the cause (head-down contact) will further reduce the effect (cervical spine fracture). Intentional and unintentional head-down contact by tacklers, ball carriers...
and blockers has resulted in serious injury at varying rates. Allowing any type of head-down contact to remain in football is a distressing misuse of information. Regardless of the injury rate, all is not well in football as long as the mechanism of injury remains.

Initiating contact with the shoulder while keeping the head up is the safest way to play football. The game can be played just as aggressively with this technique and with much less risk of serious injury.  

**FIGURE 2**

Initiating Contact

Keeping the head up at contact reduces the risk of catastrophic neck injury.

Tacklers can still "unload" a big hit and ball carriers can still break tackles using this technique. However, it is a technique that must be learned, and it must be practiced extensively.

Coaches have done a good job teaching players to approach contact with the head up. However, this is only half of the battle. It is instinctive to drop the head at contact to protect the eyes and face. Players who lower their heads at the last moment have not received enough practice time to overcome this powerful instinct. Coaches must teach players to keep their heads up at contact. Because football is a high-speed, change-of-direction sport, not every contact can be initiated with the shoulder. But with proper instruction, players can keep their heads up, which greatly reduces the risk of axial loading to the cervical spine.

Officials also play a crucial role in reducing head-down contact. A glaring discrepancy exists between the incidence of spearing and the level of enforcement of the spearing penalty during games. No matter the reason, this aspect of officiating must be drastically improved. The only feedback coaches receive on spearing are catastrophic injuries and penalties, and both seldom occur. More strict officiating and frequent spearing penalties would force coaches and players to confront the effects of spearing weekly.

Sports medicine professionals must do a better job educating football practitioners. The majority of coaches, officials and players have never been associated with a catastrophic neck injury. Realistically, most never will. Regardless of these facts, they must appreciate the movement to reduce head-down contact in their sport. Medical professionals need to speak on the topic at coaching clinics because 40 spears per game are too many. Coaches need to increase the time spent on practicing correct contact techniques, and they need to design drills that focus on shoulder contact with the head up for all positional players. Game films should be used to provide player feedback about head position on a weekly basis. Officials also must start better enforcing the spearing rules.

Everyone associated with football, including medical professionals, coaches, officials and administrators, has a moral responsibility to do everything in their power to eliminate head-down contact from the sport. Before an injury occurs, each party must be able to say, in good conscience, "I've done everything possible to protect the athletes from paralysis." Sometimes it takes 250,000 spears before an injury occurs, and sometimes it takes only one.

**REFERENCES**


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