Lumbar and Cervical Disk Herniations in NFL Players: Return to Action

Wellington K. Hsu, MD

In this issue of ORTHOPEDICS, Dr Hsu discusses the results of his study, which investigated outcomes and return to play in athletes in the National Football League.

Your study examined the performance-based outcomes following lumbar discectomy and anterior cervical discectomy and fusion in professional athletes in the National Football League (NFL). What was the purpose of the study?

As a spine surgeon, I have had elite athletes present with severe extremity pain and the diagnosis of a disk herniation. They often ask me what their prognosis is to return to their respective sports and how likely they will perform at a high level after surgical treatment. Although the peer-reviewed literature is rich with studies on clinical outcomes in the general population, no studies existed that could answer the questions that these athletes often have. From being an avid sports fan, I knew that professional athletes often underwent surgery for these conditions and that many of them had excellent outcomes. However, since no one had compiled this information, it was unknown how we, as surgeons, could guide the decision-making process for this patient population. This study was designed to provide information not only for the professional athlete and surgeons who care for them, but also the general public who have their own concerns about maintaining their respective sport and activity level.1

You reported 72% of players who underwent surgery for a cervical disk herniation successfully returned to play, on average 29 games over a 2.8-year period, which was significantly longer than that of the nonoperative group, in which only 46% returned to play 14 games over a 1.5-year period. What confounding factors could have affected this significant difference?

Several factors could have affected the differences in clinical outcome. First, NFL athletes could have had underlying diagnoses such as congenital cervical stenosis or “spear-tackler’s spine” that might affect the decision to retire from the sport. This information may not have been divulged in the information.

Dr Hsu is from the Departments of Orthopedic and Neurological Surgery, Northwestern University Feinberg School of Medicine, Chicago, Illinois. Dr Hsu has no relevant financial relationships to disclose.

Correspondence should be addressed to: Wellington K. Hsu, MD, Department of Orthopedic Surgery, Northwestern University Feinberg School of Medicine, 676 N St Clair St, Ste 1350, Chicago, IL 60611 (whsu@nmff.org).

doi: 10.3928/01477447-20100625-18
ers confirmed with cervical degenerative disk disease, “bulging disk,” neck strain, and surgical treatment other than a lumbar discectomy.2

For the cervical disk herniation study, NFL players who were diagnosed with pathology other than a cervical herniated disk were excluded from this study. Important examples were players confirmed with degenerative disk disease, “bulging disk,” lumbar strain, and surgical treatment other than a lumbar discectomy.2

For the cervical disk herniation study, NFL players who were diagnosed with pathology other than a cervical herniated disk were excluded from this study. Important examples were players confirmed with cervical degenerative disk disease, “bulging disk,” neck strain, and surgical treatment other than an anterior cervical discectomy and fusion or posterior foraminotomy.

What outcome measures were used in the studies?

Because of the nature of NFL athletes, I chose outcome measures for these studies that were important and unique to this population. Primary outcomes consisted of return-to-play rates (defined by successful return to the field) and career length after injury, measured in games and years. Secondary outcome measures were represented in part by the “performance score,” which was calculated from vital statistical measures important to each player’s position on the field. In addition, the ratio of games started to games played both before and after injury was used to assess post-treatment outcome. Each of these reported important metrics are used to gauge the relative success of a season for a given player.

Is there a significant difference in the time to return to play in surgically treated versus those treated nonoperatively?

Because of the realities of the NFL, I was not able to answer with this particular patient group. The NFL regular season is relatively short (4 months) compared to other sports, and consequently, a player’s ability and timeframe for returning to the field is more dependent on the time in which the injury is sustained than the type of treatment administered. Furthermore, since I could not control for the particular reason that a player was placed on injured reserve (and therefore ineligible for the rest of the season)—such as the quality of backup players, contractual issues, or the team success of the current season—I was not able to adequately address this question in NFL athletes.

What was the exclusion criteria?

For the lumbar disk herniation study, NFL players who were diagnosed with pathology other than a lumbar herniated disk were excluded from this study. Important examples were players confirmed with degenerative disk disease, “bulging disk,” lumbar strain, and surgical treatment other than a lumbar discectomy.2

For the cervical disk herniation study, NFL players who were diagnosed with pathology other than a cervical herniated disk were excluded from this study. Important examples were players confirmed with cervical degenerative disk disease, “bulging disk,” neck strain, and surgical treatment other than an anterior cervical discectomy and fusion or posterior foraminotomy.

Is there an explanation for why defensive backs were over-represented in the patient population in the cervical disk herniation study?

Although it is difficult to determine the exact incidence of cervical disk herniations in this population based on the methodology used in the study, defensive backs were over-represented compared to players of all other positions with a cervical disk herniation. The likely reasons for this are multifactorial, including the fact that defensive backs often must tackle opposing players that are much heavier and larger than they. As a result, an enormous amount of force must be generated (often from the head and neck) to bring the player down. Another reason for this finding may be attributed to the reliance of quick neck turns that this position requires to cover an opposing receiver. Over time, repeated, sudden neck turns could lead to further disk problems. Finally, defensive backs have self-reported a predilection to developing this injury, with difficulties playing afterward.3

How do these studies tie into the Professional Athlete’s Spine Initiative?

These studies are one of many ongoing investigations at our institution looking at clinical outcomes in elite athletes after spinal injuries. We have conducted a number of retrospective studies on outcomes in professional athletes of baseball, basketball, hockey, and American football after cervical and lumbar disk herniations. The data from our initiative have begun to elucidate the differences in outcome across sports based on different demands, positions on the field, and biomechanical forces on the spine (Figure). We are now enrolling patients in a prospective clinical research initiative to answer these questions in a more controlled and scientific fashion.
What does the future hold for treatment of cervical disk herniation in elite athletes?

Until this year, very little data were available that healthcare practitioners and athletes could use to help guide the decision-making process when faced with a cervical or lumbar disk herniation. The data in this study suggest that because NFL players can return to play at a high rate and sustain long, productive careers even after surgical treatment such as a single-level anterior diskectomy and fusion, elite athletes should not necessarily be afraid to undergo this procedure, should it be recommended. Although it appears that defensive backs of American football have poorer outcomes after a cervical disk herniation than other positions, other surgical procedures may be better suited for this type of athlete, such as a posterior foraminotomy. Our current prospective research initiative may answer questions such as these for elite athletes across several sports who may be predisposed to such cervical disk injuries.

REFERENCES

