Introduction: It is currently unknown how the exact level of cervical disc herniation (CDH) requiring surgical treatment impacts a professional National Football League (NFL) athlete's performance and/or career. Some authors have opined that an upper CDH (C2-4) should preclude a player for returning to a collision sport because of the potentially more serious consequences. This disagreement has caused players to receive conflicting opinions regarding prognosis and activity restrictions after surgical treatment. This study was conducted to determine the effect of surgical level and procedure in NFL athletes on return-to-play rates, career length, and statistical performance.

Materials/Methods: NFL athletes who underwent surgical treatment for a CDH from 1979-2012 with at least two-year follow-up were identified through a previously established protocol utilizing sources of the public record [1-7]. Successful return-to-play was defined as return to the active roster for a regular season game. Primary outcome measures also included career length (games and years played). A previously utilized "Performance Score" was calculated on the basis of pertinent statistical data, before and after surgery [7]. "Upper level" herniations were defined as C2-3 and C3-4 while C4-T1 pathology was classified as "lower level". Data analysis involved two-tailed Student t test for normally distributed data and chi-squared analysis for categorical variables.

Results: A total of 42 NFL athletes met the inclusion criteria (16 upper and 26 lower level). In the upper level group, 11 out of 16 (68.8%) successfully returned to play an average of 41 games over a 5.0-year period. A total of 20 out of 26 (76.9%) lower level players returned to play an average of 42 games over a 3.9-year period, which was not significantly different between groups. Fusions were performed in 36 players, and posterior foraminotomies in 6. Of the players receiving fusions, 3 had to retire within a two-year period attributable to adjacent level disease. In the foraminotomy group, 3 players required a subsequent fusion at the index level (50%). Furthermore, preoperative and postoperative outcome measures such as games played, games started, and performance score were not significantly different between players who sustained either an upper or lower level disc herniation. From a position perspective, while defensive backs accounted for the highest percentage (26%) in this study, a player's position did not significantly affect the return-to-play rates and statistical performance.

Conclusions: In comparison to the general population, a much higher percentage of upper level disc herniations (38%) requiring surgical treatment was identified in NFL athletes. While disagreement exists among experts regarding the prognosis and medical clearance for these players after surgery at C2-4, the data in this study suggest that postoperative clinical outcomes in these players are comparable to those who require surgery at lower cervical levels. Furthermore, although fusions were the surgery of choice for the far majority of the players in this study, the foraminotomy group had an unexpectedly high reoperation rate (50%). CDH has career-threatening implications, but an upper-level cervical herniation requiring surgery does not preclude a player from successfully returning to play at a competitive level.