

The Influence of Fracture Status in Determining the Effectiveness of Surgical Intervention in Central Cord Syndrome

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Introduction: The management of stable CCS (CCS-S) caused by spondylosis remains controversial. Current practice often favors non-operative management until spontaneous recovery occurs, or delaying surgery until a neurological plateau is reached. However, this conservative lacks robust evidence, with conflicting findings in prior studies.

Research Question: Does fracture/instability influence functional outcome in CCS patients?

Design: Ambispective analysis of 2,583 patients from five multicenter spinal cord injury (SCI) studies

Methods: CCS was identified using a uniform criterion of at least 5 point difference between upper and lower extremity motor score. Neurological outcome was assessed using ASIA motor scores, and functional outcomes was measured using the Functional Independence Measure (FIM). One-year outcomes, including the proportion achieving the minimum clinically important difference (MCID), were compared between CCS-S (stable CCS) and CCS-U (unstable) patients. Outcomes were modelled using multivariable regression with interaction terms for surgery and fracture/instability.

Results: Among the 291 CCS patients, 205 (70%) underwent surgery, and 86 (30%) were treated non-operatively. A higher proportion of surgical patients achieved FIM-Motor MCID (57.1%, $p=0.018$). Surgery was mainly beneficial for CCS-S patients, with 66.7% achieving MCID versus 34.2% in the non-surgical group ($p<0.001$). Fracture significantly reduced the odds of favorable outcomes at one year (p value for interaction = 0.04, OR 0.32, 95% CI, 0.11-0.98).

Discussion: Surgical intervention improves functional outcomes in CCS patients, especially in CCS-S. Individualized management strategies tailored to patient-specific characteristics are crucial in SCI management.

Figure 1: Odds of Achieving FIM MCID, stratified into CCS-S and CCS-U patient phenotype

Fig. 1

