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Delayed Diagnosis of Spinal Cord Injury in the Elderly and Its Impact on Treatment Strategies – Insights from Japan Multicenter Study

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Title: Delayed Diagnosis of Spinal Cord Injury in the Elderly and Its Impact on Treatment Strategies—Insights from Japan Multicenter Study

Background: The prevalence of spinal cord injuries (SCIs) in the elderly is rising in hyper-aged societies. Delayed diagnosis (>24 hours post-injury) remains a significant issue, impacting treatment decisions and outcomes.

Design: This retrospective multicenter study analyzed factors associated with delayed diagnosis of SCIs in elderly patients using data from the Japan Ambitious Spine Association (JASA).

Methods: Data were collected from 1,509 patients aged 65 years or older with cervical spine or spinal cord injuries. Variables analyzed included patient demographics, injury mechanisms, pathology types (fractures, dislocations, SCIWORA), treatment strategies, and American Spinal Injury Association Impairment Scale (AIS) scores at injury and final follow-up.

Results: Delayed diagnosis occurred in 220 patients (14.6%). These patients were older ($p=0.047$), more dependent on ambulation assistance ($p<0.001$), and more frequently injured from low-energy mechanisms such as falls ($p<0.001$). Non-spinal cord injuries were an independent risk factor (OR 1.63, 95% CI 1.12–2.29, $p=0.01$), while multiple organ injuries were less common ($p=0.013$). Among fractures, delayed diagnoses were more frequent in Anderson Type 2 fractures (37.3% vs. 53.6%, $p<0.01$). In SCIWORA cases, delayed diagnosis correlated with higher-level intramedullary signal changes and an increased rate of surgical interventions (85.2% vs. 44.9%, $p<0.001$).

Discussion: Underdiagnosis of Anderson Type 2 fractures and SCIWORA highlights critical gaps in early detection. Delayed diagnoses lead to more invasive treatments, especially in SCIWORA cases where surgical intervention is often necessary. These findings stress the importance of enhanced diagnostic protocols to minimize delays and optimize care.