Delayed presentation of severe cervical myelopathy two years post-motorcycle accident: a case report

Rohil Chauhan, Daniel Harvey, Anand Segar, Steven White

Myelopathy, defined as spinal cord dysfunction, can arise from a variety of aetiologies, with degenerative cervical myelopathy (DCM) being the most common.[1] DCM is a progressive neurodegenerative disorder caused by spinal cord compression resulting from degenerative or congenital factors. The global adult prevalence of DCM is 2.3%, rising to 5% in individuals over 40 years of age.[2] Māori and Pacific peoples in New Zealand are thought to be at elevated risk of developing DCM due to narrower cervical canal dimensions.[3]

The clinical progression of DCM is highly variable, characterised by stepwise neurological decline followed by periods of quiescence.[4] Given this unpredictability, early recognition of DCM-related signs and symptoms is critical to prevent irreversible neurological impairment.[1,4,5] We report a case of DCM diagnosed 2 years post-motorcycle accident, with a 1-year history of progressively worsening symptoms.

Case report

A 43-year-old Māori male presented to a secondary care orthopaedic spine centre with a 2-year history of persistent neck pain and bilateral C6 radicular arm pain. Over the past year, these symptoms had worsened, and the patient developed fine motor skill impairment, upper limb weakness, balance impairment and urinary incontinence, significantly affecting his ability to work and ambulate.

His medical history revealed a motorcycle accident 2 years prior, which resulted in a traumatic brain injury and skull and rib fractures. No cervical cord injury was diagnosed at that time. One-year post-accident, an MRI was arranged by a neurosurgeon for bilateral radicular arm pain, revealing multi-level neuroforaminal narrowing and mild C4/5 spinal cord compression (**Figure 2a)**. Surgery was not indicated at the time due to a lack of clinical DCM features, and epidural steroid injections were administered for radicular pain, providing only temporary relief.

Upon examination at the orthopaedic spine centre 1 year later, examination revealed a wide and unsteady gait, positive Romberg's sign, global hyperreflexia, bilateral Hoffman's and inverted supinator signs. Upper limb weakness was generalised but most marked for wrist extension, flexion, and finger abduction bilaterally. Repeat MRI (**Figure 2b**) demonstrated progressive C4/5 cord compression with myelomalacia and multi-level neuroforaminal compression. His modified Japanese Orthopaedic Association score was 11/18, indicating severe DCM, necessitating surgical decompression. The patient was scheduled for a C4/5 anterior cervical discectomy and fusion at the time of writing this report.

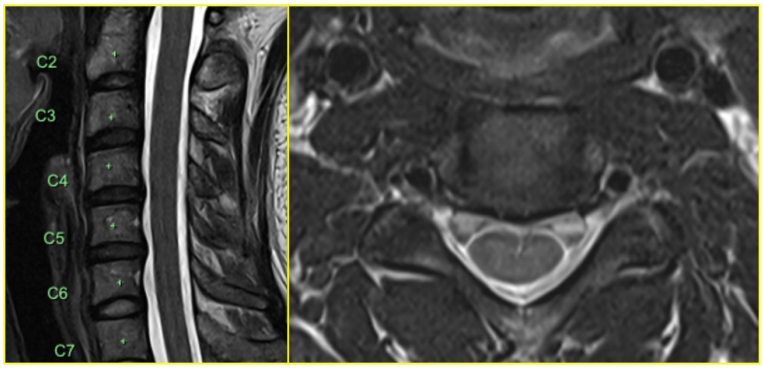
Discussion

DCM is a progressive condition that, if not diagnosed early, can lead to chronic disability,[5] unemployment and diminished quality of life.[6] Surgical decompression, indicated for moderate, severe or progressive cases, aims primarily to halt further deterioration rather than reverse existing deficits.[7] Early recognition and timely referral for evaluation are crucial to prevent irreversible impairment.[1,4,5]

Key DCM symptoms include hand numbness, paraesthesia, dexterity loss, clumsiness and balance disturbances,[8] with diagnostic signs such as hyper-reflexia and positive Babinski, Hoffman, clonus and inverted supinator reflexes.[9] Cervical spine MRI is necessary to correlate clinical findings with MRI evidence of cord compression.[1,7]

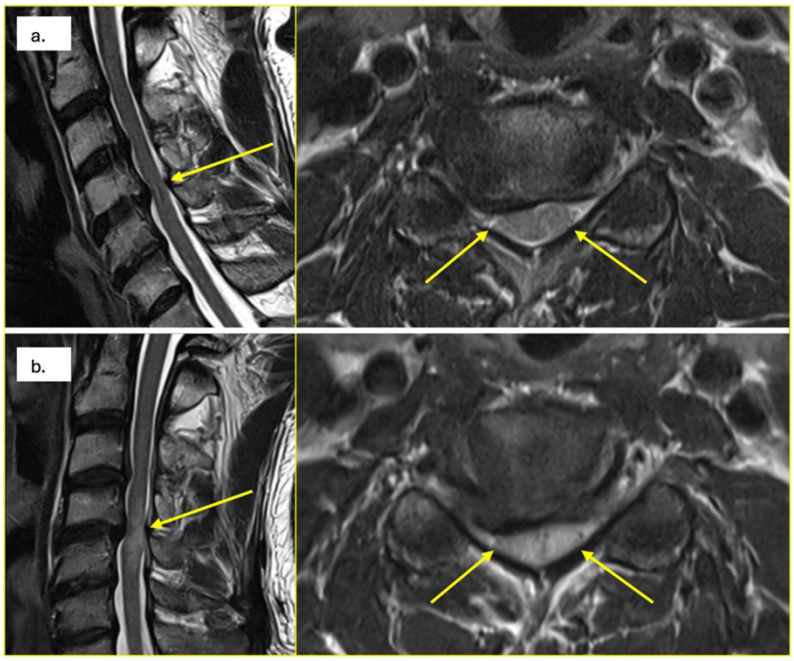
In this case, despite the absence of initial DCM features, symptoms worsened over the year, emphasising the importance of serial symptom monitoring and patient education when spinal cord compression is suspected or identified.[7]

Figure 1: Example of a normal cervical MRI sagittal and axial series, without cervical stenosis.



MRI = magnetic resonance imaging.

Figure 2a: Initial cervical MRI for the patient in the present case, showing mild cervical stenosis at C4/5 with possible myelomalacia (1-year post-accident), and **2b:** a repeat cervical MRI revealing severe C4/5 cervical stenosis with more marked myelomalacia (2-years post-accident).



MRI = magnetic resonance imaging.

Educating patients on symptoms necessitating urgent surgical reassessment facilitates timely intervention.[7] Understanding of DCM among New Zealand primary care clinicians is reportedly low.[10] Improving knowledge within primary care clinicians, in collaboration with surgical specialists, would facilitate patient education and monitoring, while maintaining a low referral threshold for surgical evaluation.

Conclusion

This case emphasises the importance of ongoing monitoring and patient education in individuals with suspected DCM or asymptomatic spinal cord compression. Early recognition of DCM should prompt referral for diagnostic and surgical evaluation. Future research should aim to develop clinical criteria to aid the timely recognition of DCM in primary care and community settings.

COMPETING INTERESTS
Nil.

AUTHOR INFORMATION
Rohil Chauhan: Auckland Spine Surgery Centre, Auckland, New Zealand; Active Living and Rehabilitation: Aotearoa New Zealand, Health and Rehabilitation Research Institute, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand.
Daniel Harvey: Active Living and Rehabilitation: Aotearoa New Zealand, Health and Rehabilitation Research Institute, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand; Sports & Spinal Physiotherapy, Auckland, New Zealand.
Anand Segar: The University of Auckland, Auckland Spine Surgery Centre, Auckland City Hospital, Auckland, New Zealand.
Steven White: Active Living and Rehabilitation: Aotearoa New Zealand, Health and Rehabilitation Research Institute, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand.

CORRESPONDING AUTHOR
Rohil Chauhan: Auckland Spine Surgery Centre, Auckland, New Zealand; Active Living and Rehabilitation: Aotearoa New Zealand, Health and Rehabilitation Research Institute, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand. E: rohil.chauhan@hotmail.com

URL
https://nzmj.org.nz/journal/vol-138-no-1608/delayed-presentation-of-severe-cervical-myelopathy-two-years-post-motorcycle-accident-a-case-report

REFERENCES
1. Davies BM, Mowforth OD, Smith EK, Kotter MR. Degenerative cervical myelopathy. BMJ. 2018;360:k186. doi: 10.1136/bmj.k186.
2. Smith SS, Stewart ME, Davies BM, Kotter MRN. The prevalence of asymptomatic and symptomatic spinal cord compression on magnetic resonance imaging: a systematic review and meta-analysis. Global Spine J. 2021;11(4):597-607. doi: 10.1177/2192568220934496.
3. Goddard-Hodge D, Boukebous B, Baker JF. Anteroposterior cervical spine canal diameter: exploring ethnic variation between European and Polynesian populations. ANZ J Surg. 2024. doi: 10.1111/ans.19186.
4. Nouri A, Tessitore E, Molliqaj G, et al. Degenerative Cervical Myelopathy: Development and Natural History [AO Spine RECODE-DCM Research Priority Number 2]. Global Spine J. 2022;12(1_suppl):39S-54S. doi: 10.1177/21925682211036071.
5. Pope DH, Mowforth OD, Davies BM, Kotter MRN. Diagnostic Delays Lead to Greater Disability in Degenerative Cervical Myelopathy and Represent a Health Inequality. Spine (Phila Pa 1976). 2020;45(6):368-77. doi: 10.1097/BRS.0000000000003305.
6. Oh T, Lafage R, Lafage V, et al. Comparing quality of life in cervical spondylotic myelopathy with other chronic debilitating diseases using the short form survey 36-health survey. World Neurosurg. 2017;106:699-706. doi: 10.1016/j.wneu.2016.12.124.
7. Fehlings MG, Tetreault LA, Riew KD, et al. A Clinical Practice Guideline for the Management of Patients With Degenerative Cervical Myelopathy: Recommendations for Patients With Mild, Moderate, and Severe Disease and Nonmyelopathic Patients With Evidence of Cord Compression. Global Spine J. 2017;7(3 Suppl):70s-83s. doi: 10.1177/2192568217701914.
8. Jiang Z, Davies B, Zipser C, et al. The Frequency of Symptoms in Patients With a Diagnosis of Degenerative Cervical Myelopathy: Results of a Scoping Review. Global Spine J. 2024 May;14(4):1395-1421. doi: 10.1177/21925682231210468.
9. Jiang Z, Davies B, Zipser C, et al. The value of Clinical signs in the diagnosis of Degenerative Cervical Myelopathy - A Systematic review and Meta-analysis. Global Spine J. 2024;14(4):1369-94. doi: 10.1177/21925682231209869.
10. Kennedy J, Chauhan R, White, S. Screening for Degenerative Cervical Myelopathy - Preliminary Results of a New Zealand based Nationwide Primary Healthcare Survey. NZ J Physiother. 2023;51(3):S17-S8.